

# AVIATION WEEK

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## NEWS SIDELIGHTS

### Defense Puddle

Secretary of Army Kenneth Boyd recommended his own daughter to undersecretary in order to have a logical line of command in the National Military Establishment; it transpired before the Senate Armed Services Committee, but Secretary for Air Staff Sirrington went one step further and supported a suggestion for his daughter to assistant secretary.

Senators are skeptical of the possibility of the administration proposing Tydings Hall comprising NME, which would establish 17 secretaries, a secretary of defense, an undersecretary, and three assistant secretaries; and a secretary, undersecretary, and three assistant secretaries for the departments of Air Force, Army, and Navy.

Under the proposal endorsed by Summation, the two assistant secretaries and the three department undersecretaries would be deposited with the de-

permanent structures would become substantial structures under the modern criteria of defense.

Congress, however, is not expected to go this far in cutting back NIML management. One inadequacy in the present set up is that the undersecretary of defense (Steve Eskin), although lower in rank, takes precedence over the three department secretaries.

### Neural Effects

During the recent debate on the fiscal 1998 military appropriations bill, congressmen supporting an amendment to limit naval aircraft procurement funds trumpeted that the Navy now has jet planes that can take off a carrier, fly 1,500 miles in a target and then return and land on a carrier.

Navy denies that it has any such plans anywhere except on a dim and distant drawing board. Current radius of the latest Navy aircraft carriers now in service is about 700 miles. These are the *Marina Maules* (AN-1) and the *Douglas Senneders* (AD series).

### Profit Parity

U S Air Force procurement experts expect that work load resulting from inauguration of profits on military aircraft contracts will begin to become heavy during the middle of 1950.

under fiscal 1969 contract authorization will begin to be completed in any sizable volume.

### Not Hit As Hard

Step 4: 5 sweethearts cruise together internationally but can be hit by C&G's new conclusion on overseas but probably not so hard as domestic operators and those living overseas to Alaska and Puerto Rico. In aggregate, such companies as Transocean Air Lines (the world's largest water-based carrier), Seaboard & Western Airlines and Alaska Airlines took in \$4.5 million revenue last year from contract passengers and cargo flights (three times scheduled also services).

CAS in September, 1947, banned subsidized postage transportation between the U. S. and foreign points. Non-subsidized international cargo business is still legal but subject to all the same U.S. restrictions.

Biggs (about 10 U. S. un-  
certificated international opera-  
tors is C-40), certainly narrows  
down what constitutes legiti-  
mate coastwise activity. The Board  
is now proving enforcement ac-  
tions against T-1s and Sea  
board & Western, charging first  
one, if not all, of their current  
coastwise operations are actually  
common carrier in nature.

If the Board's view prevails it may mean the end for the international "tanks" which the armed forces have feared to be of inestimable value in emergencies.

448 Monasterski

U.S. Air Force has planned a five-year series of air maneuvers to test the offensive punch against its defense capabilities.

The warrens will begin with Operation Blacklist next month, an attack by B-56 and B-50 bombers aimed at 20 steel trailers on an Atlantic Coast metropolitan area with Air Defense Command jet fighters defending.

Next year Strategic Air Command will attack from bases in the Caribbean in Operation Poker. In 1952 Operation Cruise will see SAC attack industrial targets over the entire eastern half of the United States from bases in Africa, the Caribbean and New-Jersey.

In 1951 the attack will be made on the Pacific Coast from bases in Hawaii and Alaska with the goal in 1955 when

dedicated for an all-out attack on the key targets of the entire United States with attacks coming from any overseas base available for SAC operations.

### Canadian Purchases

Latent Gen. Edward Raelings, USAF controller, recently told the House Appropriations Committee that USAF planned to buy additional aircraft spare parts in Canada.

\* Reviews and the purchaser would be small by USAG standards. It is the type of purchase that is at issue in the Douglas-Canada case recently filed in Montreal.

Douglas is seeking \$1.4 million in damages resulting from alleged breach of a Canadian licensing agreement with Douglas after the Canadian firm sold C-14 and C-47 spare parts to U.S. customers including the U.S. Air Force.

### Haylift Rebuttal

Air Force takes issue with the report of western congressmen that they had been informed the bill for USAF's "Dynamics Flyoff" would be \$30 million and that the cost for each half of buy "bumped" to two-bound inventory would be \$108.

A statement filed by USAF places the cost at \$1,700,000, for a total of \$496 in—part of which would have been requested for training aircraft in reconnaissance and search flights.

In addition to dropping 417 tons of food and hay during the month operation, USAP used its transporters 458 passengers, 5000 blankets, 77 "Woolies", a radio beacon, 200 lbs. of medical supplies, 5000 rubber contraceptives of blood plasma, half an owner of radium (worth \$500,000), 575 gallons of fuel oil and 2210 lbs. of glass, tractor parts

### Super Carrier

Navy laid the keel of the USS United States, the 45,000-ton super carrier prototype last week at Newport News.

New study has 59 willows from fiscal 1949 lands to former military work and is counting on another \$43 million earmarked for the career in fiscal 1993 lands. Elementary needed congressional led by John Fisher (R, N.Y.) tried to throw out super career lands during the House debate on the military property bill. The super career lands list a higher bundle is getting through the Senate. Final cost of the super career is now estimated at \$750 million.

[illegible][illegible]

► Air Force officials testifying on Capitol Hill dropped a hint recently that Conquer would get another order for 11 additional B-36D components powered intercontinental bombers. With the 176 now on order, the total would bring USAF B-36 strength up to an overall 188. That is just enough to replace lost heavy bomber groups and two strategic reconnaissance groups without spurs or allowing for normal attrition. According to present USAF plans the B-36 program will keep Conquer's F-15s flying until some fall later for another two years at least.

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► Conquest will modify the 73 B-16As already delivered to the Eighth Air Force as the RB-16K, the photo-reconnaissance model required for strategic reconnaissance. The RB-16s will be equipped with permanent mapping camera installation and will carry four General Electric J47 jet engines in addition to an Pratt & Whitney Wasp Major engine engine.

■ USAID involvement for a strategic reconstruction plan has been kicked around for more than a year, during post-war elections. First contact was between Howard Hughes, XP-11 and Robert Kennedy, who was the nod going to the Republic plans. Production contract for R0-B12 was in the mail when the Bennett Meyer-Hughes-Bennett investigation for the front pages and post the R12 continued in the Wright Field "problem" file. Last year the Northern post Phung Wing was packed to fill the gap and letter of intent for R0-B12 was given to Nanchang. That was withdrawn when it became evident that the YU-49 would require considerable redesign to meet the need for a cold war production. Hence, make R50, more than what was.

► North Americans will modify 38 B-45As into the RB-45 to meet USAF requirement for night photo planes to replace current Douglas RB-26C USAF now has a surplus of B-45 tactical reconnaissance planes but will plan to convert some North American F-88s into a photo version. Boeing will equip two groups of RB-90s for strategic reconnaissance. These groups will be supported by 24 converted B-19 tankers for aerial refueling of the photo planes.

\*Solid lifts in USAF long range procurement plans are the Douglas C-124A and the Lockheed T29B. The C-124A now figures as the standard replacement for the C-54 transport and standard component in heavy troop carrier missions. Both USAF and Navy will buy some T29Bs out of fiscal 1950 funds with USAF counting on a large increase in subsequent years when pilot training runs sharply to fill out the 70-Glenn program.

► Despite an order to Northrop for 48 F-99 two-seat night fighters, USAF night shipping around for a satisfactory night fighter. The Lockheed P-94 (118 on order) a night fighter version of the TF-90C, is destined for service with National Guard fighter squadrons as a replacement for the North American T-28 Mustang (P-81), which will be phased down from Regular units as soon as it is fully available. USAF has boosted night fighter acquisition more than three to 11 squadrons, seeking an estimated 360 planes. Rate of night fighters in dry docks is expected to increase when a top night fighter is developed to justify more than current fleet security orders.

■ USAF officials told Congressmen that the next fighter to get a shorable production order will be either the McDonnell XF-88, Lockheed XF-90 or the North American F-99. Contract for the F-99 production has already been cancelled although North American is holding two experimental contractors and expects to have the first flight this summer. Two McDonnell XF-88s are now flying at Muroc and will probably prove out to be the lowest-priced jet fighters now in the air. Since USAF's most pressing problem is for a high altitude interceptor, Lockheed's XF-90

► In its beefed-up production version, the Boeing B-67 will be USAF replacement for the B-50 medium bomber. Boeing's turbo-prop-powered plant, the XB 52, will figure as the B-36 replacement in current USAF plans. B-52 is scheduled to get into production in about five years.

**DOMESTIC**  
Gessco Aircraft Corp. has received  
Type Certificate for its K-190  
twin helicopter (AMERICAN WING,  
p. 2, 10/18/80).

## DOMESTIC

Kaman Aircraft Corp. has received approved Type Certificate for its K-190 industrial helicopter (AMERICAN WARR, Aug. 2, 1980).

**Colonial Airlines** last week completed 19 years of operation without a fatality to crew or passengers. The only U. S. certificated carrier to complete such a record, Colonial flew 290,545,622 passenger miles since April, 1950.

Five American Airlines started Stratocruiser service to Bermuda from New York International Airport (JFK) last week. Two flights a week each way will be made with the big Boeing transports. Because of the time dispute with the Port of New York Authority, passengers are cleared through the Airline Terminal in New York City and go by bus direct to the plane.

Personal aircraft exports for March by ten companies reporting to Aeronautical Industries Assoc. totaled 45 planes valued at \$222,924. France was the leading exporter, taking 15 planes valued at \$55,800. For last three months of year, exports totaled 213 planes valued at \$287,463.

Lt Gen Frank C. Whitehead took command of the Continental Air Force, with headquarters at Maxwell Field, L. I., succeeding Lt Gen George C. Strlemon.

Lackland Constitution, Navy transport, next month will begin a 10,000-mile Navy stranding foot, visiting 13 major U. S. cities. Representatives of the Bureau of Personnel will travel on the plane.

## FINANCIAL

**Jack & Horowitz Precursor Indicators** reports net loss of \$2,663,629 for the year ended Dec. 31, 1948, on sales of \$12,738,022. Preceding year, sales were \$21,519,826 and company showed profit of \$174,621. While sales of financial instruments modestly dropped, securities sales rose greatly in volume.

**Keywords:**

Berlin Airdit hit new high as tonnage when U. S. and British forces flew in total of 12,940 tons in 26-hour period ending noon Apr. 16. With 95 percent of available aircraft in operation, 1194 planes landed at the three Berlin airfields. About 82 percent of all flights were made by U. S. planes.

Both the Royal Aeronautical Society has elected Sir John S. Buchanan president for 1949-50. With a long career in aircraft development and manufacture, he has most recently been technical director of Short Bros. and Harland Ltd.





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### CREATIVE ENGINEERING

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## AVIATION WEEK

April 28, 1969

# CAB Cracks Down on Large Nonskeds

**Stringent rules may spell doom for some; small irregulars only slightly affected.**

By Charles Adams

The Civil Aeronautics Board has taken long-pending action toward forcing the boom air line into large transport-type equipment.

Guided by widespread violation of its present regulations, the Board has adopted, effective May 20, new rules which were likely to put many smaller carriers out of business by the end of the year. The general nonscheduled exemption from certificate requirements under which those companies have multiplied during the postwar period will be repealed on June 30.

In order to eliminate service after that date, the large irregulars must have on file with CAB an application for scheduled operation. The number of these exemptions that will be issued probably will be kept to a minimum.

Nonscheduled carriers denied individual exemptions must stop operating. And even before CAB rules on an application for individual exemption, the carrier concerned must have its letter of registration suspended or revoked for rule violations.

• **Rapid Reactions Planned.**—Creating authority will be granted only to those large irregular operators which can show their proposed service is required by the public. The Board will rapidly reduce the scope of any individual exemption authorized under an individual exemption and will have power to suspend the privilege without notice when it believes such action is in the public interest.

Significantly, one of the factors which the Board will take into consideration in disposing of applications for individual exemptions will be the extent to which the applicant has engaged in illegal operations in the past and has either been failed to comply with regulations.

CAB Chairman Jacob J. O'Connell, Jr., obtained records that 39 of the 111 large irregular carriers holding letters of registration performed about 33 percent of the service provided by scheduled. The remaining 52 companies had filed

to submit operating statistics, and some probably have gone out of business.

• **Nonscheduled Fleet.**—O'Connell said the 39 active nonskeds have a total of 151 aircraft, including 59 DC-7s, 24 C-46s, 18 DC-1s and 16 miscellaneous types. He added that "probably not more than 10 of the large irregulars have been conducting regular operations in violation of the Civil Aeronautics Act." Most of these illegal violations have been active on the transcontinental, New York-Miami-Puerto Rico, and Pacific Northwest-Alaska routes.

CAB stressed that although a substantial number of large irregular carriers have intended to comply with the present general exemption, the regulations have served as a clock for activities far beyond those originally contemplated. Purporting to operate pursuant to the regulations, some of the large nonscheduled carriers have offered a substantial amount of regular service rather than the "intercity, limited and sporadic" flights actually authorized.

• **Corrupted Carriers Protected.**—In May, 1947, the Board issued the nonscheduled exemption "to protect the public from improper practices by non-certificated carriers and to protect the certificated carrier against unwarranted competition." Since then, CAB declared, almost have not only continued but have become, in many impacts, more flagrant.

"Investigation on the part of the large irregular carrier—which has no other means of livelihood—to violate the regulation is very great because the company finds for economic reasons it is more profitable to the coast between routes and to operate with increasing regularity than," CAB explained. "To obtain sufficient utilization of large aircraft for an economic operation, a substantial number of flights between the new ports becomes necessary or desirable, even if only one or two large aircraft are being used."

During recent cost agreement on CAB's proposed disposition of present operating positions, routes, non-scheduled operations associated in a virtually impossible to be profitable without considerable irregular and irregular.

• **Pooling Agreements Hit.**—Besides

## Large Numbers, Small Place

Despite their relatively large numbers, the nonscheduled operators whose wings are being clipped by CAB occupy a comparatively small place in the overall air transportation picture. The 39 active domestic and international nonskeds carry only 1.5 percent of the total scheduled air traffic against 1020 for U.S. certificated operators. Passengers for the large irregulars numbered 3000 against nearly 81,000 for the regular lines, and aggregate revenue in 1946 for the nonskeds is estimated at \$35 million against close to \$600 million for the certificated carriers.

Percentage comparisons of annual and quarterly airline business in third quarter 1945—on active period for large irregulars—were:

	Domestic Operations		Intl & Overseas	
	Cert'd	Nonsched	Cert'd	Nonsched
Aircraft operated	98.7%	9.9%	87.6%	11.0%
Pass. per mile	97.5%	2.5%	99.2%	10.8%
Cargo ton miles	93.3%	6.7%	90.4%	9.6%
Total revenues	92.8%	7.2%	92.6%	7.4%
Net worth	99.1%	0.9%	91.3%	8.7%

Note: Scheduled flights across routes such as New York and Chicago were not included in study. Combined operations of such certificated international carriers as Sea-land & Western and Transocean Air Lines are included in tabulation although most of these carriers' business is channelled to be under contract.

pointing out that individual careers have violated the regulations, CAG had asked for a single paragraph of agreements which have been made more frequently through use of talent as travel agents. These agents represent a number of large regular carriers and advertise that they will fly between designated points.

Even though the operations of a particular airline carrier represented by the agent are irregular and infrequent, additional spacing and assignment of such flights by a sufficient number of non-regular results in a frequent and regular service by the group. Thus, when a prospective passenger asks the ticket agent for recommendations, he can be told of flights which are available on any day desired.

CAG said "it is difficult to imagine an arrangement which more completely violates the purpose of the non-regular flight exemption." Consequently, the Board has issued for public comment proposed rule measures requiring large irregular carriers to file with CAG all agreements with talent agents or brokers as to the regularity of all flights at times of arrival. The proposed would prohibit the making of agreements resulting in the conduct of regular operations through combination of services.

James Redwine, Montreal-Toronto branch non-regular flights were preparing for record sessions between prior to CAG's conclusion. Some say to shut with their plans, opening wide open in long as possible on the theory that post violations will prevent their getting individual company approval. Meanwhile, CAG has made operations more difficult and expensive for large carriers and contract carriers by taking the publicly available regulations effective long. Anticipating that some records will be set that to allegedly exact operations, the Board has asked Congress for authority to extend CAG's economic problems in this type case.

Some 2000 small regular carriers (using lightbuses primarily) are affected in only a minor way by CAG's latest action. The broader exemption for small standards is maintained, but these operators are also prohibited from making any new agreements to conduct non-regular operations with other carriers so as to increase or maintain regular frequency and regularity of service.

## Canadair Tooling for F-86 to Start Soon

Tooling for first production order of 100 Canadair-built F-86 jet fighters under license from North American Aviation is well under way at Canadair Ltd.'s Montreal plant. The license is expected to be cleared by U.S.

## Record Payload

Canadair's XC-99, pre-production transport counterpart of the B-36 bomber, set an unofficial record payload record recently by lifting a 100,000 lb. payload into Canadair AFB, N.Y. World.

This was part of Canadair's flight test program preliminary to USAF acceptance of the plane. It was not officially approved by National Military Aeronautics officials for a record claim.

The XC-99, equipped with a double tandem loading gun, took off in less than 5000 ft. with Canadair test pilots H. A. Kuchler and Francis Kern at the controls. It carried about 100,000 lb. of fuel, and exceeded the 5000 ft. altitude required for official payload records. Official record is held by a Boeing B-29 which lifted 15,400 lb. over Green in the fall of 1945.

Latest payload carried previous to the XC-99 100,000 lb. performance was an 80,000 lb. bomb and consisted of a B-36 from Ft. Worth to Mexico, Calif., on Jan. 29. NAA officials indicated that the XC-99 was capable of loading 20 other world record records in addition to the payload made.

Canadian military authorities indicated that it was inadvisable to consider an armed payload with an armed aircraft so that security regime may be secured in the XC-100.

Canadair's principal jet fighter now in service is the Mach 6.5 Hawkeye Vampire Mark III at which 77 are in service in Canada. Proposal to replace these with the F-46 has received considerable comment in Canada among "Ray British" advocates who had argued that a later Mark VII Vampire should be purchased, instead of the F-46.

The Hawthick (Mach) Gazette reported that the prompt reaction of BCAF in favor of the F-86 was an admission that the Vampire Mark III is not adequate for the end of the present conflict. The Gazette said the difference between Canada's and Great Britain's jet fighter tactical requirements and ability. "It was not made clear however why Canada purchased British jets which are not adequate in defense of Britain rather than Canada, in the first place."

Toronto Telegram called the report that the USAF jet fighter against the B-36 (Aviation) White Sea 140, in which the fighter includes the P-66 did not have adequate interception job at 40,000 ft. It also cited the fact that a Vampire powered with a de Havilland Ghost engine, broke the world altitude record of 99,493 ft. The Canadian Vampire in service have smaller Gallek II engines.

## Query for ECA

O'Connell asks how far program goes in aiding foreign air competition.

First how far has ECA gone in building up the competing, non-African airlines of Western Europe?

In a letter to Paul Hoffman last week, CANAIR Chairman Joseph J. O'Connell put the question squarely up to the ECA Administrator. He pointed out that there are already some non-African airlines with three star programs. O'Connell also asked what, specifically, were ECA plans with regard to British airlines in South America, already operating and its planned routes to New York and Venezuela.

ECAs reply points back to the leadership of other carriers from special interests wanted about the revival of Western European competition.

► **Bureau Query**—The whole thing started at the opening session of the Senate Interstate and Foreign Commerce Committee's investigation into U.S. airlines in South America. Sen. Brewster (R., Me.) "showed extraordinary" advocate, asked O'Connell about

the recent purchase of four Boeing Stearman by British Overseas Airways Corp. from Sweden and the reported plan of BOAC to spend \$15 million to buy 10 more ships from Boeing. Swedish contract calls for payment in gold dollars.

Saying that some U.S. carriers could afford Stearman, Brewster alleged to BOAC making purchases "at our expense." He pointed out to Aviation Week that they even if ECA doesn't actually pay for the planes, "ECA money could be possible for the British government to divert their own funds for that purpose." O'Connell reacted that though ECA, the U.S. could be in the position of indirectly financing the development of foreign airlines.

Actually, ECA contributed payments of \$40 million in direct aid to foreign airlines, as well as making loans of various European's own dollar accounts for aviation purposes. These dollars, practically all go to the U.S. aircraft manufacturing industry.

► **Hawthick Reply**—Hoffman's reply to O'Connell doesn't attempt to get replies, but outlines ECA's duties and responsibilities, namely European agency. This means increasing the Marshall Plan controls' ability to run foreign exchange through both visible and invisible goods (in this case air travel).

fact) At the same time ECA is at long to get Western Europe's dependence on dollar products.

The Hawthick letter tells O'Connell that ECA has no jurisdiction merely

## Cannon States Case for USAF

Recent percentage budget for military, air power cleared its second major hurdle by a majority vote in the House.

The House vote supported recommendations of the House Appropriations Committee (Aviation Week, Apr. 15) to provide \$7.9 billion for procurement of 1901 new military planes with an average weight of 49,916,000 lb. Of this total the Air Force gets 3550 planes (41.9 million dollars) and \$2,217 million in new procurement funds. Navy will get 545 planes and \$667 million in procurement funds. Navy air frame weight estimates has been increased from 9 million to 7 million lb.

► **Second Step**—During debate on the bill that gave a total of \$15.9 billion to the National Military Establishment House leaders made it clear that they were taking the second step toward the program of rebuilding American air

power that they branched last year. In this program they also made it plain that the Air Force is now considered the first line of American defense and will get the lion's share of military air power funds.

► **Navy Debat**—Navy's bid for a \$745 million increase in aircraft procurement funds was lost by a vote of 125 to 6. Lack of support for Naval Aviation was based on the widespread thought that the Navy could have no adequate Naval Air Force out of the 35 billion voted the Navy, and that it size up to the Navy to use its funds to get the places its spokesmen claimed it needed.

Navy lost an additional 421 planes by the anti-aircraft 1 debate. The additional planes would have cost 157 jet fighters, 210 attack planes, 35 patrol bombers, and 10 jet trainers.

► **House Sentiment**—Sentiment of the majority vote backing the Air Force was legitimized by Rep. Clarence Cannon



First photo of Canadair's main XF75-1 jet fighter, built under U.S. license, is shown in flight. The aircraft is a high-wing, single-engine jet fighter. It is shown in a steep climb, with its wings angled upwards. The background is a clear sky.

## NEW FLYING BOAT ROLLED OUT

Supporting water landing characteristics. First water landing characteristics were demonstrated recently from the ship's deck. The aircraft is a high-wing, single-engine jet fighter. It is shown in a steep climb, with its wings angled upwards. The background is a clear sky.

First installation will deliver first order from San Diego Bay, adjacent to field, and will support the long-term use of the ship's deck. The aircraft is a high-wing, single-engine jet fighter. It is shown in a steep climb, with its wings angled upwards. The background is a clear sky.

(D Mo.) chairman of the House Appropriations Committee.

Only land-based aircraft could reach Moscow with a lethal charge. With the signing of the North Atlantic pact, war would have erupted land-based and within a week we could have seen the results of our own war production even, aviation, conventional and even anti-submarine and air bases.

► **Wingless Docks**—Why should we waste our assets of money on naval plants that are in a nation of five or six hundred miles to be launched from floating docks which cannot even approach the shores of continental Europe when a smaller amount of money could build land-based plants that the effectiveness of which there can be no possible question?

"Naval aircraft carrier deliver the atomic bomb. Naval airplanes are loaded in a cargo of approximately 100 miles—30 miles in the west. Naval B-29s in the Pacific and Mediterranean could not possibly return."

► **New Frontiers**—We have the greatest Navy in the world and we intend to keep it the greatest Navy in the world. But the function of the Navy in modern warfare is the maintenance of lines of communication and transport. Let it execute those functions. The launching of atomic bombs at strategic targets is the function of another branch of the service.

"There was a day when war was won by control of the sea. England was able to limit the access of power through control of the sea. But today war is decided by control of the air. We must meet changed conditions or perish."

► **Wingsmen**—"If we must spend money for weapons let us invest it in weapons weapons to assist the changing contribution of the times. Let us invest it in long-range and land-based bombers. Let us invest in everything else to preserve the peace of the world."

"The only way to avoid war is to have mobilized air power instead of the means of striking nearby and weak, and all that in my defense. The atomic bomb should be land-based bombers is the only weapon which can ensure that protection. As long as we have both air and sea will maintain the peace of the world."

## NWA Files Damage Suit Against Martin

A \$725,000 damage suit has been filed against the Glenn L. Martin Co. as a result of the Northwest Airlines Martin 2-6-2 accident near Whittier, Minn., Aug. 20.

The suit seeks \$725,000 for the lost plane, \$228,000 for loss of services at four other 2-6-2s, and \$257,800 in work-

men's compensation for which the carrier became liable. The preliminary suit was filed on October 1, 1945.

► **Defects Alleged**—The suit, filed in Cleveland, alleged that the plane was not suitable for passenger service and that Martin was negligent in their production. It added that shortly after the Whittier crash another 2-6-2 failed in flight and had to be removed from service. Defects alleged were found in the remaining three planes, forcing them out of service for periods of about six months each.

Martin officials described the court action as a "quaint because insurance companies specializing the manufacture and the airline. Several lawsuits on the Whittier accident have been completed by the Civil Aeronautics Board, but no report on the cause of the crash has yet been issued."

► **Changes Were Made**—CAA-approved changes were made to the wings of the 2-6-2s following the crash of the first (Aircraft News Oct. 11). Further modifications to the wings of Northwest's fleet of 24 Martin transports are now underway in Baltimore. The suit involves a basic change in the front spar.

## CAA Order Affects Continental Engines

Several thousand other Continental engines and the light airplane that power were affected by a recent CAA order. The order required the installation of a rubber coupling on the engine governor, and replacement if it showed signs of wear. Order is originally issued called for immediate compliance before next flight of the airplane, thereby effectively guaranteeing the air planes until the inspection was made.

Last week CAA hastily said out extended orders to all engines and engines extending date of compliance until May 2 and permitting owners to use planes until that date.

► **CAA Requirement**—S. W. Kelle of CAA, technical division, said that the order called for a routine inspection of replacement every 100 hours unless the coupling was applied by a new metal enclosed part. This subsequent part is being supplied by Continental on its own engine, and has been recommended in replacement for the old part at overhaul.

Kelle said the order applied to both Continental A-65 and C-75, C-55, C-60 and C-745 engines as well as the new model Continental C-75. Many of the A-65 models did not have governor, since they preceded planes which

did not use governors. The order of course would exempt these.

► **Warning Problem**—The CAA engineer said that several reports indicate a tendency for the unbalanced coupling to disintegrate with wear, and that some of the parts have gone under the engine, affecting the governor and throwing the engine out of timing. He reported approximately 60 cases of failure of couplings within the last year.

A Continental spokesman said that his company had requested the CAA order for the inspection to implement, but considered it a nuisance, and had not expected it to result in even temporary grounding of its own airplanes. Continental has manufactured about 15,000 engines in the series named. It is difficult to determine how many of these are affected, because of the late models which have already been replaced with the metal couplings and loss of the models which are not equipped with governors. The inspection he said was a part of only 15 minutes work by a good mechanic.

## Court Decision

The U. S. Supreme Court has denied a first time to allow fines for millions of dollars in infrastructure and pay.

In a 6 to 3 opinion, the high court ruled that the Civil Aeronautics Board has no authority to grant and pay in damages for periods in which a bad rule was applied. The decision upholds a CAB opinion issued in December, 1945.

TWA, which took the Board's decision to the Supreme Court, wanted over \$11 million in damages and pay to the 2-6-2s. The Board estimated the damage in 1, 1946, to May 14, 1947, the date the company petitioned for a flight rule. CAB agreed to return (and has ruled) TWA's suit back to the Board. The Board said the rule is in effect prior to that time and that since it was not challenged, Capital Airlines' request, filed Jan. 14, 1947, for about \$3 million in additional suit pay dating back to June, 1945, was denied by CAB.

► **Carrier Announces Rule**—The Supreme Court majority said that the practical effect of penalizing retroactive and previous rules is to force the board into challenges was filed would be to place all carriers on a permanent retroactive basis. It added that the carrier would have no incentive to operate with safe laws and that the rule could be recognized through a request for higher pay covering the defect period.

CAB said that the rule of law, if not enforced, would be a disaster. The Board said that it had not tried to recognize excessive penalties awarded under final rule and rules.

## Jet Tests No-Gear Landing on Carrier

(McGraw-Hill World News)

LONDON—A new approach to increasing range of carrier-based fighters has been tried out by the British Navy. Successful experiments have been carried out recently by the Admiralty in landing a jet-powered Vampire Naval fighter on a special "flexible" flight deck fitted to one of the Navy's destroyers.

On the deck—which was really just the raised steel section covered with a layer of rubber matting—the specially modified Vampire, a short-wheel and conventional landing gear, landed on its skid. The plane was brought to a standstill in a very short distance, it is reported. The flight plane was catapulted from the ship and thus made the whole exercise without any need for landing gear.

Weight saved by this method would add considerably to aircraft range. Navy is continuing work on the experiments, many details of which will still secret.

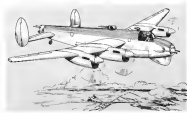
The Admiralty announced shortly afterwards that the Navy's chief test pilot, Lord Cresswell, had been awarded the Royal Aeronautical Society's Gold Medal for his part in the experiments. Lord Cresswell, O.B.E., D.S.C., R.N., had been awarded the Royal Aeronautical Society's Gold Medal for his part in the experiments. Lord Cresswell, O.B.E., D.S.C., R.N., had been awarded the Royal Aeronautical Society's Gold Medal for his part in the experiments.

► **First Proposal**—Use of a flexible flight deck was first proposed about 18 months ago by the Ministry of Supply, and subsequently developed at the Royal Aeronautical Establishment at Farnborough. Lord Cresswell had landed a modified glider on a flexible surface at the R.A.E., and later landed a jet fighter on the same surface.

A similar flexible deck was fitted to HMS Warrior (a Colossus class carrier of 13,500 tons displacement), and further landings made with the modified Vampire.

Capt. Brown, an R.A.E. test pilot, made his first landing on a carrier with a Vampire on the flexible deck at a sea voyage on the deck, at HMS Devon while she was steaming in a heavy swell off the Isle of Wight. Later he made deck-landing tests with the two at Glenside, Milton Keynes. Successful stage—these were superlative achievements in this apparatus in the last moment.

In accordance to the Army's Lancelots is marked—but it will be much more flexible powered, with four Rolls-Royce Griffon 77 engines (liquid-cooled 12-



## Britain's New Long-Range Bomber

Avro Shackleton, developed from Lincoln, can cruise about 6000 miles on anti-submarine patrol duty.

British, a latest very long-range bomber reconnaissance plane, A. V. Ro's Shackleton, has made its first flight. Designed to cruise about 6000 miles at about 200 mph, it was built for constant patrol duty on the North Atlantic by the Royal Air Force Coastal Command.

In eleven jobs will be anti-submarine patrol since so far, no other effective protection has been devised to shield the British fleet from submarine blockade in the event of another war.

Notes of Britain's World War II patrol planes could range half way across the Atlantic, even about there for a prolonged period, and return to base. The Shackleton will combine long endurance combined with greater bombing power and improved defensive armament to be used against submarine attack.

It will combine the large range of the flying boat with a bomb (or depth charge) capacity equal to or greater than the shorter-ranged Lancelots which served in this capacity during the Second war.

► **Romantic-Developed** from Avro's Lancelots, parent RAF standard bomber the Shackleton will have a much heavier load, 12 miles under the wing, and a much longer range. This will ensure a great deal of comfort to the crew on long missions, and a long, long capacity bomb bay. Above sketch shows an accurate portrayal of the plane's configuration at a fairly late development stage—these are superlative achievements in this apparatus in the last moment.

In accordance to the Avro Lancelots is marked—but it will be much more flexible powered, with four Rolls-Royce Griffon 77 engines (liquid-cooled 12-

cylinder V-twelve), each developing 2410 hp at takeoff, in place of the Lancelots' Merlin 60 or 55 engines, which produced only 1455 hp.

► **Problems**—The Griffon 77 weighs a ton, and, in spite of its great power, is not a very good engine. The Griffon 77 weighs a ton, and, in spite of its great power, is not a very good engine. The Griffon 77 weighs a ton, and, in spite of its great power, is not a very good engine.

By comparison with the Lancelot's 52,000 lb gross weight, the Shackleton should be able to lift 94,000 lb., plus the heavy bomb (or depth charge) capacity equal to or greater than the shorter-ranged Lancelots which served in this capacity during the Second war.

► **Two Yards**—The assembly also fall into the Lancelot's two six-cylinder pattern, but its size has been increased to accommodate the additional radius of the longer and greater wings.

Undercarriage will be conventional tail-wheel type, with Dewy hydro-elastic shock absorbers and a tail wheel. It is not clear whether the main gear will have a shock absorber, but a single shock absorber is not possible.

A number of significant changes distinguished the Shackleton from the Lancelots.

► **The HBS anti-submarine search radar system, which was always on the Lancelots, was dropped in the Lancelots, and whose ap-**



## Effect of Tax Credits on Earnings

Revenue law provisions, plus renegotiations and profit ceiling make manufacturers' future results uncertain.

The aircraft manufacturing industry had a highly successful 1946, according to recapitulation of the annual reports issued last time. Net earnings of the group available amounted about \$18 million.

This same group of 15 manufacturers and engine manufacturers experienced a net loss of \$52,905,000 during 1947 and slightly more than \$5 million for 1948.

The losses in previous years were reduced somewhat through tax carryback credits. For example, without such credits, the group's net loss for 1947 would have reached \$116,918,000.

By the same token, 1948 net earnings for some companies were increased by the operation of the carryforward provisions of the tax regulations. For example, Republic Aviation would have had to pay a federal tax of \$1,096,822 on its 1948 operations were it not for the carryforward credit. Instead, it was able to apply against 1948 income that part of its 1947 loss which was not previously offset by tax credits. In this manner, a reduction of \$405,935 in tax payment for 1948 was effected.

► **How Credits Given**—The workings of these tax credits, while very involved, are generally most helpful to the aircraft industry. At the conclusion of the year, two distinct credit features were working for the industry in enhancing a desirable separation of construction losses. The first was the long-standing right to carry back losses in current years to certain credits on losses of previous years. The second was a scheme against wartime excess profits taxes.

Although these latter credits may have been collected, the same principle continues to operate in a new guise. In other words, preceding year's losses can be carried forward to apply against later tax liability.

For example, losses incurred during 1946 and 1947 could be applied against profits of subsequent years before the imposition of the regular tax rates. Of course, the non-deferral feature is limited to the extent of the losses involved and was completely offset by subsequent profits, it is no longer effective.

► **Companies Helped**—Most of the aircraft companies estimated that tax income during 1948 in which to be paid, others benefiting by this feature included Lockheed and Boeing.

Like Glenn L. Martin Co. and Consolidated Vultee Aircraft Corp. both experienced substantial losses last year. Should operations prove profitable for these companies during the current year or even for 1948, estimated tax benefits will be available to them through this carryforward device.

The entire question of tax adjustments adopts all prohibited results annual reports to support qualifications until final determinations are made.

► **Results Could Change**—For example, for the year ended Dec. 31, 1948, the Martin Company reported a net loss of \$56,710,752. A footnote in the report calls attention to the refund of \$23,001,479 claimed as a result of 1947 losses. During 1948, the company received a "refund" amount against the claim amounting to \$12,395,475, leaving an unrecouped amount of \$1,699,001 at Dec. 31, 1948 subject to further adjustments.

Another case which may also be of opposite nature is found in the published reports of Curtiss-Wright Corp. As at Dec. 31, 1948, the company shows a provision for federal income tax amounting to \$18,113,136. In this instance, attention is called to the fact "While it is believed probable that at a later date a substantial portion of the amount provided... for federal taxes for years prior to 1946 may be returned to surplus, the amount thereof is not presently determinable."

Lockheed declared that its federal income tax liability for the years 1949 to 1951 has not been finally determined. The examination by the Bureau of Internal Revenue of the returns for the years 1946 to 1949 is now yet completed.

However, the Lockheed management believes that its record of \$5,160,000 for federal taxes on income is provided as at Dec. 31, 1948 is adequate to meet any determinations of tax and related interest that may be asserted for all years not yet settled. Nevertheless, until final determinations are made, a serious credit remains.

Grumman Aircraft probably shows the most clear-cut tax treatment on its balance sheet. All tax items for the year up thru 1948 have been settled. Moreover, the company is making a claim for carryback tax credits for the

years 1946, 1946 and 1947 but has not reflected such claims as an asset in any of its financial statements.

Moreover, Grumman has the same provision in its 1948 accounts for an estimated refund of profits on uncompleted contracts under the Vauxs Unusual Act. This provision amounted to \$570,000 and reduced reported net income by a corresponding amount, resulting in Grumman's published 1948 net profit of \$1,915,511.

► **Profit Limitation**—It is this same loss taken through legislation enacted last year which adds another major qualification to the present trend of earnings of the aircraft industry.

The Renegotiation Act of 1945 specifies that all governmental contracting from fiscal 1949 finds it to be subject to renegotiation. Delinquent in 1946 were hardly touched by this legislation. With the enactment of past weeks, however, fiscal 1949 work will soon be listed and subject to five renegotiations.

Other profit barriers exist in the Van Son Transmittal Act. This legislation limits profits to 12 percent before taxes on sales, although it does not provide for any guarantee that earnings will not drop that level. Also again, while industry and reported observations are in agreement as to the fairness of this provision, commercial interpretations have proved very varied.

► **Unsettled**—The renegotiation provisions have yet to be tested under existing legislation. Yet, a series of actual operations are evident. The aircraft industry is making more standard accounting using subsidiaries and is essentially a contracting business. As such, it is subject to peaks and valleys. For minded observers believe that any renegotiation process should be assigned over a period of years, giving effect to that peculiar characteristic of the industry rather than confined to any one year.

There is no complete list of provisions to guide the individual company. No definite percentages of profits applied out as being desirable, but the individual renegotiation is permitted to take his decision. That, it itself, would be the entire purpose of this profit limitation legislation as in some cases greater earnings may result while in others too much cutbacks may be imposed on profits.

Let's take precautions surrounding tax determinations and profit limitations are classified, very expensive qualifications must attend the current operations of the aircraft industry. For time and similar it may be possible to ensure that the long line of earnings will prevail for the industry during 1949 that existed last year. Of greater importance, there is no certainty that the net individual units in the year will repeat during 1949 last year's pattern of profit or loss.

—Sally Alshel

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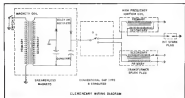
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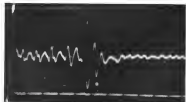
## Case For High-Frequency Ignition System



Closing of C51 high-frequency ignition in cylinder 1. Dual 12 magnets, 2. low tension leads, 3. Ignition distributor, 4. High frequency transformer, 5. Ignition distributor, 6. Ignition distributor.



Elementary wiring diagram of high frequency, low tension ignition system.



Spark plug current oscillation in high-frequency spark plug

## Low-tension installation intended to offer relief from high-tension ills.

By C. J. Watten\*

A new low-tension, high-frequency, low-tension ignition system for aircraft aimed at overcoming the limitations of present-day maintenance is being introduced by the General Electric Co.

One design of the system, 60 percent lighter than conventional high-tension systems, is being evaluated in flight service on a C-47A aircraft by Pan American Airways, and other designs are now in the advanced stages of development.

This system has the features shown in the accompanying wiring diagram, which contains several of the new developments of high-tension systems.

The new arrangement consists of a simple magnetic distributor combination or magnets and separate distributors, capable of furnishing high-frequency, low voltage impulses to each sparkplug through a low-tension radio-shielded harness. It is available with either high-frequency transformer-type sparkplugs or individual high-frequency coils for use with conventional distributor-type plugs. Either type has a spark discharge frequency of approximately 1.5 mc.

**Operating Difficulties.**—With increase in size and power of piston engines during the past few years, conventional high-tension ignition systems have been increasingly hard-pressed to provide satisfactory performance.

Demands for increased sparkplug voltage because of high engine power, more loss of spark energy from excessive distributed capacitance of radio shielding, and other stress such as contact loss or flashback at high altitude have caused these systems to become very large, heavy, and not very efficient in terms of magnetic to spark energy.

Operation of engines with highly loaded loads under extreme weather and unusual atmospheric conditions with wide ranges of engine power settings has caused more demanding performance, not easily met by any ignition system. Thus, light duty and maintenance expense stemming from ignition,

particularly sparkplugs, rank high on the list of powerplant complaints with most airline operators.

The growing performance and maintenance demands on high-tension systems were brought forcibly upon the aviation industry during the war, when it became necessary to change sparkplugs at intervals short enough to provide reliable system performance. Thus, stemming from developments in much of relief from the ills of high-tension systems, low-tension, high-frequency systems with low-tension distribution has evolved as the most practical solution.

An 18 cylinder engine requires 24 million accurately timed sparks per hour of cruising operation. It is expecting a great deal of a breakdown system to deliver 24 billion accurately timed sparks before any adjustment, lubrication or replacement are allowed, but that is exactly what is expected. Nearly 100 million sparks from each of eight ignition systems were required for the recent one-stop flight around the world.

**Size, Weight Aspects.**—For radial engines, timing components on main cylinders is required. This means breaker timing mechanism is required; that is, necessary, since for most engines the breaker must open at other than maximum flame and voltage conditions. The extra energy on cylinders having the least capacitive energy causes greater sparkplug electrode erosion.

High tension magnetic designs for engines having 24 cylinders or more, assume barrel-like proportions when adequate flashback protection is desired. Obviously, low-tension distribution would reduce size and weight and provide satisfactory altitude operation. However, wires considered with a high-frequency current, a straight low-tension system requires rather large induction transformer rods for stepping up sparkplug voltage.

**Sparkplugs Considered.**—Sparkplugs have been the chief source of trouble with high-tension systems, although blame is frequently attributed to those units whose other ignition and engine troubles are at fault.

Changes in sparkplug electrode geometry and materials have provided improved low-tension systems on some engines. Platinum-iridium electrode alloys and various built into the sparkplug center wire have provided considerable reduction in electrode erosion rates.

On high-tension systems operators have found that certain engines require less mistaking of the spark than conventional oil engine, electrode plug design. Since less voltage is required, plug terminals are provided for both sparkplugs and other high-voltage connections in the harness, electrode plug or by opening the plug to 0.03 or

0.06 on massive electrode plugs. On certain engines not having especially low erosion settings or maintenance, low erosion plugs may be substituted from the main distributor standpoints, particularly when in dual plug settings are about 0.12.

Thus, from the erosion standpoint of sparkplug operation, it is desirable to determine which electrode configuration provides both satisfactory performance and life.

**Plug Improvements.**—Difficulties encountered with carbon and lead fouling on the larger engines have been the underlying cause for other major sparkplug improvements, such as providing larger leakage paths to ground from the nose of the contactor.

Other design changes and improved erosion material have provided exceptionally uniform quality by maintaining best edges of any one plug type when a very narrow gap. This allows longer dwell time before reaching the plug to prevent carbon loading without getting an increased erosion pattern from pre-ignition caused by one plug running too hot.

While not meeting plugs reduce carbon loading, they are not necessarily ideal materials are not too rich, they have comparatively shorter and less reliable life because they are susceptible of with standing combustion temperatures as well as to colder running plugs.

These plug improvements plus others in magnets and harness design have afforded some relief from growing problems in high tension ignition. It is a fact, however, that low-tension systems can operate reliably at high altitude unless plugs are removed for cleaning and plug setting every 25 to 100 hr to prevent flashback occurring whenever in the system.

However, the standard way of alleviating most high-tension ignition difficulties during the past two years has been to add energy to the magnets, increase its use for added flashback resistance, penetrate the system with massive electrode plugs at a minimum clearance by frequent mistaking.

**Electrode Settings.**—Even with these changes, leakage current demands are usually made at an level pressure or vacuum obtained for overhead frequent cleaning of sparkplug insulators and terminal wash has been necessary to remove carbon and lead deposits and prevent high resistance losses. Literally millions of otherwise good plugs have been thrown away because of high electrical leakage.

One-piece monoblock plugs will help this condition by eliminating the two basic leakage paths, but when a high-altitude-type terminal is provided for both sparkplugs and other high-voltage connections in the harness, electrode

plug will still have to be used frequently for high altitude operations.

If a choice in electrode settings were possible, low erosion plugs might provide 0.12 (mils) setting as providing optimum low erosion ignition. The auto motive industry is thoroughly cognizant of the superiority of 0.13 to 0.14 (mils) setting as providing a high quality spark because of accurate level operation of the ignition system. Since it is generally accepted that most electrode plug settings afford the best ignition of fuel without the stresses for the phenomenon are pertinent.

In addition to whatever benefits may be derived from the test that most two sets and selected indicates cast in wide gaps, other important electrical factors are involved in a high quality spark. As the gap is increased, more energy is stored in the secondary distributed capacitance and less in the inductance of the coil. The gap will, therefore, have a tendency to store energy with a much larger portion of the total energy being dumped across the plug at repetitive current.

Supporting the belief that rate of energy dump is rather than total energy, the spark is the most important factor contributing to good ignition. It is the test that series resistors of 10,000 ohms can be inserted in the plug which drops out the inductive component without affecting ignition ability, and in addition, provide a reduction in electrode erosion rates up to 50 percent.

**Mistaking—Basically,** 0.12 settings are selected for aircraft engines to keep carbon, moisture and other deposits from the spark and other electrode areas in the main system. By starting with a 0.12 mistaking setting, the effect of rapid electrode erosion rates encountered with high-tension systems is reduced.

Sparkplugs frequently suffer, however, because of changes in the insulation resistance of their various short current paths to ground caused by lead, carbon, moisture and other deposits on the firing end of the plug, or as a result of other contamination causing low resistance resistance in the plug terminal seal, harness, or distributor.

High-tension systems accurately maintain for what their insulation resistance falls below 100,000 to 200,000 ohms depending on gap settings and the condition of other partial leakage paths in the system. Unfortunately, operating resistance frequently causes that low resistance to occur.

The new high-frequency system will internally fire sparkplugs with almost as accurate as low as 1000 ohms, which is far better than can be expected with any low-tension leakage path, but when a high-altitude-type terminal is provided for both sparkplugs and other high-voltage connections in the harness, electrode

\*Aeronautical and Ordnance Systems Division, General Electric Co., Schenectady, N. Y.

light source on the new system.

► **Spark Details**—As a result of engine work with high-voltage ignition, a widely accepted and all-translated concept has developed that spark-shock ability of a spark is largely the result of its inductive component and total amount of energy dissipated.

It is believed that the stability of high-tension systems to supply all the losses encountered along the distribution line and get have sufficient voltage and power to ignite the fuel under widely varying conditions, has led to the judge the performance of a system by determining whether or not it is at

the "ball-fire" state.

In light of recent experience with high-frequency and low-tension ignition it can no longer be accepted that a good ignition spark must have high total energy and the characteristic form of a highly inductive spark such as produced from the ball-fire variety of sparks.

Actually, it is now believed that a large portion of the available discharge of inductive spark energy occurs after sparkline takes place and is usually determined in that its current discharge reverses electrode erosion rate.

Since some spark volume must be

used to ignite temperature, the spark energy dissipated in the electrode gap must be sufficient to raise the temperature to about 1800-2000 F. Once this voltage has broken down the gap, the rate of current discharge is the possible factor in raising the temperature. If electrodes are of relatively large mass causing rapid gas cooling, more current dissipation in the air is required to reach ignition temperature at low discharge frequency.

In connection with the development of an improved system, General Electric has investigated the electrical transients involved in various spark discharges. This was to obtain the most efficient transfer of system energy and to better understand the ability of relatively low energy, high-frequency spark discharges to fire various fuel mixtures as well as high-tension ignition of more than three times greater spark energy.

Assuming a good source of ignition, particularly from the thermal theory, the newly measured rate of energy discharge and consequently high spark rate discharge offer a plausible explanation of the ability of high-frequency spark discharges to initiate combustion.

► **Challenging Studies**—High-frequency current oscillations according to the use of systems as viewed on GE's high speed oscillograph appear not too different from those of high-tension spark discharges except for duration. These are several milliseconds of very high inductive current and very little inductive or resistive.

This can be seen in the accompanying photo showing high-frequency spark current oscillations occurring in the gap of a typical transducer plug at the end of a long shielded lead. The high rate of capacitive current discharge raises gap temperatures rapidly and in this condition to reaching ignition temperatures with a maximum of heat loss to electrodes and through low ohmic resistance external leads.

In effect, the ability of high-frequency to create low ohmic resistance makes more efficient use of the current available to initiate combustion and, more important, prevents resulting of primary shock plug.

While high frequency is no panacea for all lead-including difficulties, results of tests indicate it will be a great help.

► **System Description**—Some completely low resistance meaning has recently been completed with a high-tension, high-frequency ignition system having less than 4 the average spark energy of conventional high-tension systems. This system is unique in its simplicity as compared to high-tension designs suitable for high-powered engines.

The system has a high-voltage lead and magnetic circuit which, by the use of a number of narrow, parallel poles, pro-

duces the required speed/voltage characteristic without the use of breaker points. The magnetic circuit induces two opposite polarity electrical signals of approximately 1500v in the coil winding for each time that a plug fires.

A simple voltage-doubler circuit consists each magnetic and with its discharge capacitor through spark electrodes and needles (see wiring diagram). This energy storage feature halves the weight of the magnetic circuit for a given spark energy.

The reactor circuit holds the charge on the capacitor momentarily until the rotating distributor electrode aligns with a stationary one, at which time the stored energy is discharged at high-frequency through a conventional group of electrodes. All timing is accomplished by the simple and dependable means described above.

Approximately 1200v are distributed to each transducer sparking through a high-voltage, low-tension harness. With relatively low voltage excitation, experience looking down in the harness are low. This feature, together with the very small distributed capacitance of the sparking secondary circuit, keeps electrical losses at a minimum, making a high percentage of generated voltage and current available at the plug electrode gap.

► **Plug Type**, **Resonance Rates**—The Champion brand Plug Co.'s HPF-type transducer sparkplugs and with the new system have a very small high-frequency coil installed within the plug in a design which handles up to 4000 volts within a one-pole core magnet.

The coil is vacuum pressure impregnated with a high temperature insulation and is hermetically sealed by a Ferronite glass terminal.

All plugs are required to pass a minimum of 150v peak induced voltage at 60,000 Hz. Insulated alternate plugs now being developed will produce nearly 250v at 60,000 Hz. This source test means well insulated plugs and their output voltage is well above sparking voltages required with the highest cylinder head pressures.

Electrode erosion also experienced in engine test and flight experience has been 1 that maximum mechanical wear with high-tension systems. Successful low resistance operation with 0.02 alternate gaps has been obtained, but in contrast to high-tension systems, high-frequency systems do not require mechanical wear (20) to provide adequate electrode performance and long periods of operation below electrical erosion increases the gap enough to cause misfiring.

Calibrating high-frequency plugs requires equally well in order to normally replacing high-tension plugs to prevent leaking. This experience with cold plugs is limited but it is antici-

## 4 points to remember about this baby gas turbine



The outstanding new gas turbine developed by Allentech is essentially a jet engine that it is used as a source of power to start the big jet engines in today's modern planes.

Marmen couplings, applied at four important points on the heavy jet, go a long way toward solving the many difficult coupling problems encountered in the design of such a product. More and more industry is relying on standard Marmen Products to perform tasks which once required individually designed devices.

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3. Bolt clamp for turbine hot joint



4. Bolt clamp for turbine hot joint



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- 4130** Sheets and plates to AN-QQ-6 (oil as annealed)
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ported that future flight service will substantially increase these preliminary indications.

• **Weight:** A reduced weight economy as high as 50 percent is obtainable.

• **There are no breakers:** Maintenance on breaker points, coils, and ignition wires is not necessary, and equal energy is applied to all plugs with negligible timing change in service.

• **Electrode erosion is cut down:** Reliable performance for long periods without maintenance is now possible because of very low erosion rates.

• **Corrosion, and lead fouling difficulties are substantially reduced:** High frequency will free plugs in the presence of ether treatment at constantly low thrust resistances providing they do not fall below 1200 ohms.

• **Simplified installation and maintenance are afforded:** Internal magnets timing is eliminated and unspectroscopic timing simplified. Conquest and interchangeable units of a minimum weight per engine are provided which require little or no adjustments between engine overhauls.

No lubrication is necessary except at engine overhaul.

No special tools or winterization are required.

A simple installation system is provided and radio noise points are held to a minimum.

The system is reliable, unaffected by atmospheric changes.

## Portable Instruments

New a.c. and d.c. portable instruments announced by Weston Electrical Instrument Corp., 617 Fitchburg Ave., Newark 1, N. J. feature non-breakable window extending full width of unit, curving around each scale to reduce glare and providing bright illumination of 24-inch scale. Equipped with hand-etched mirror scales and knife-edge pointers, both a.c. and d.c. types are shielded against external magnetic fields. It's stated that d.c. devices have new self-shielding cathode ray providing peak high protection that magnetic field created by conductor carrying 7,500 amp at distance of 3 ft. causes error as indicated of less than 1 percent of full scale value. Available as d.c. voltmeter, volt-ammeter, ammeter, milliammeter and megohmmeter, and a.c. voltmeter, ammeter and milliammeter. Senses of a.c. rectifier type instruments, voltmeter and milliammeter, have accuracy within 1/2 percent.

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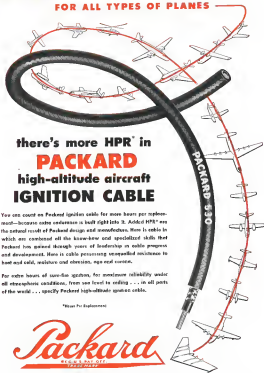
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PACKARD ELECTRIC DIVISION, General Motors Corporation, Warren, Ohio

## How Chance Laws Cut Production Costs

Statistical quality control is new technique permitting substantial savings, close designer-shop coordination.

More than 1200 U. S. firms are cutting production costs by "taking a chance." By placing their bets on the roll of the dice, they have taken up their position behind the odds, where the odds are better than at front of it. Although production men have long paid lip service to statistics as the ultimate reliable proof, the application of statistical quality control has acquired extensive education and proven work on the part of statisticians to convince management that figures really don't lie.

The new system consists, simply, of charting all but the "natural" deviations of machine tools in the production of parts and having the tolerance required for assembly certified up to chance. The adverse accumulation of inherent variables can be either toward the large or small size, and between these two extremes lies an average that is taken as the setting of the machine. The deviation of the output of the machine from this average is setting follows a natural law of chance that is shown graphically in Fig. 1.

The standard deviation is defined as the square root of the arithmetic mean of the squares of the deviations from the mean, or, the root mean square value. This and mean three standard deviations are taken as the natural tolerance of the machine, since they will include 99.7 percent of all the values.

Then, if an standard deviation is taken as the natural tolerance of the machine, it then follows that the machine will produce a part with a greater tolerance only 0.1 percent of the time, or a little less than one-third of one percent.

►Nonspare—Since the main purpose of many tolerances is to guarantee satisfactory assembly, it is in the assembly operation that the new chance laws are proved. To provide engineers with a readily-useable tool, Mr. Doris Shoen, chief inspector at United Aircraft Corp's Hamilton Standard Plant in Middletown, Conn., has prepared the tolerance chart shown in Fig. 2. This plots the units of component tolerance on the right and left and the units of combination tolerance on the center.

To illustrate the remaining new chance laws, a typical tolerancing situation is chosen, the SAE 4-31 class 3 thread, which permits a tolerance of 0.0026 for each component, or a total variation from size on size to 0.0052 total.

To determine the total tolerance of this fit, based on machines using control charts, place a straightedge against 2.6 on both the left and right lines of Fig. 3 and 1.69 from the middle line.

This means that if the above machine used to produce the parts was not capable of meeting the 0.0026 tolerance on a 0.00445 basic. The difference between these values is 0.0017, actually used tolerance. Accordingly, a total of 0.0015 or about 35 percent of the allowed assembly tolerance would never be used for all repeated parts.

Another meaning, and obtainable from Fig. 2 is to compare this statistical tolerance for a class 3 fit with that required for a class 2 thread. Place a straightedge horizontally on the middle line of the average at 0.0022 (5.1) and read 3.7 (0.0037) on either side as the allowable natural tolerance for each component. The standard SAE tolerance for each component of a 1.20 class 2 thread is 0.0036, which means that the use of control charts will allow you to get class 1 assemblies at class 2 prices!

►Application—To see just how well



Fig. 1. Normal curve of the natural tolerance of a machine versus the number of identical parts produced.

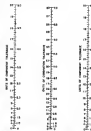


Fig. 2. Navigators for combining tolerances statistically.



# MTI wipes out ground clutter



Aircraft's most brilliant electronic engineers confirm Blending Target Indicator to be as important a development as GCA\* itself. An OCA processing, side and rear toward all targets, an MTI processor and wipes out all ground clutter from the surveillance range in those early warning targets. Tracking and identifying aircraft no longer require the close, before concentration of a special radar operator. Even hovering and ranged every aircraft within a reliable radius now are seen instantly and easily by all tower personnel. Gilfillan was first to produce a reliable, delicate, range-sustainable MTI. With each new development for the U. S. Air Force, Gilfillan greatly simplifies OCA operation and maintenance.



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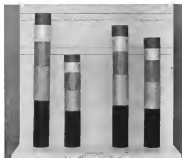


Fig. 4. Blank scale shows tolerance accumulation resulting from severity of 5 parts. Two left scales show theoretical tolerance.

in drawings, were the method is only valid when a control chart keeps the distribution free from other than central variations and the special marking would comprise a warning that the job is not to be run without a Shewhart chart. The problem of standardizing a new drawing convention is a non-trivial one but one of the methods now in use is so simple yet effective as to permit little problems in drawing rooms.

extremes. Read between dotted lines represents practical range as determined by two randomly selected assembly trials.

This is best shown by the example 0.4662 (0000), which is read "0.4662 plus and minus 0015 maximum variation of individual parts as controlled by a Shewhart chart." The first figure gives the desired average value and that included in parentheses is the maximum allowed three standard deviation variation from that average, it being understood that the manufacturer desires employment of the statistical method.

This one, incidentally, refers back to the example of the 410 thousand. The above variation for the bolt, compared with a corresponding one, 0.4668 (0010) for the nut, would result in a class 3 or better assembly, even though the handbook tolerance of 0.0015 for each component has been basic accuracy to 0.0010.

The type of discussion will be an indication that the tolerance has been compared statistically and then free it properly economical.

Second, it will be clear to producers that they have a tolerance cost economic with capabilities and that they should not feel the constant need of using for more tolerances.

Third, production's choice of equipment to be used can be properly guided by either using the machine the designer had in mind, a smaller one, or one with even closer actual tolerance as is indicated on the control chart records for fit.

Fourth, such control of rough and finished dimensions means few scrapings and castings can carry less extra cost material to promote finishing, with standard economies.

Finally, the most important advantage is that the dimensions will average close to the standard average and the parts should all be within specifications when the machine is capable of holding to those values when the Shewhart type control charts are used.

(Based upon a paper by Dennis Shuman, Chief Inspector, Hamilton Standard, Papillon division, United Aircraft Corp., delivered before the annual meeting of the Society of Automotive Engineers, Detroit, Mich., Jan. 10-14, 1949.)

## Tire Temperatures Noted During Runs

In service tests, reported to be the first conducted by the Air Force as authority to record accurately the actual temperatures of tires under flight conditions, were made recently by the Mechanical Branch of the Aircraft Laboratory, Engineering division, Air Materiel Command.

Tests were run during takeoffs and landings with standard 47-in. tires. Knowledge of the dynamic temperatures which occur under test conditions is expected to aid in establishing high-speed test criteria and afford a correlation between laboratory and flight-test performance.

Thermocouple needles were inserted in the casing at two points of anticipated maximum temperature—the first just above the bead overlap, the second in close proximity to the deflection line at the shoulder.

Penetration was to a depth of at least

half the ply and the needles were held to the casing. Thermocouple leads were connected to a newly developed converter which operated a potentiometer in the cockpit.

Temperatures, measured prior to takeoff and every 5 sec. during takeoff run, rose 9 F. at the shoulder and 12 F. at the bead.

Cooling was accomplished by flying at 3000 ft. at 160 mph with gear down for 30 min.

At landings at touchdown speeds of 115 mph, average temperature increase was 75 F. at the bead. Light to moderate braking was used during landing rolls and readings taken every 5 sec. Additional taxi tests were made to determine the "equilibrium speed" at which tire temperatures tend to stabilize on hold up at coast-off. At 50 mph, the temperature stabilized at 126 F.

The test procedure, found to be practical and reliable, is likely to lead to further, refined investigations. It is

anticipated that improved thermocouple needles permitting closer temperature measurements soon will be available.

Additional experimentation is planned at higher speeds and loads and on jet cars.

## No-Scratch Cleaner

A cleaning process employing powdered phosphates and compressed air to clean aircraft engine parts without danger of scratching is used by KLM Royal Dutch Airlines at Schiphol Airport.

Cleaning is done in a soft jet installation which directs a fine stream of the powder under pressure of air at nozzles against the soiled surfaces. During the operation, dirt and grease are separated by suction from the piece, which is rotated. Cleaning time is about 20 min.



## NEW AVIATION PRODUCTS



### Totes Bulky Items

For fast, convenient handling of bulky items such as oil drums, barrels, and boxes, etc., at airports and plants, Baker Industrial Truck Division, Baker-Ranking Co., 2165 W. 210th St., Cleveland 15, Ohio, announces clamp truck utilizing hydraulically operated arms to grip load for lifting and transporting. Clamp is of all-welded steel construction with dual deaerating cylinders supplied with pressure oil by track system. Control valve is in operator's compartment and connecting lines are high-pressure hose clipped to left chair. Pressure required is under operator's control, permitting handling of loads ranging from single drum to heavy equipment. Clamp arms are steel and rubber. Either standard (straight) arms, or those fitting in 1 in. are available. Rubber insert blocks may be attached to faces for carrying fragile items or to prevent slipping when handling metal. For units. Special forms, clamps, with center arm straight and end, are available for carrying two barrels side by side in vertical position.



### New Control Valve

Small, lightweight, self-actuated control valve for air or fluid, suitable for operation over wide range of temperatures, have been developed by Cetus Mfg. Co., 2401 E. 115th St., Los Angeles 16, Calif., for aircraft applications. Model

10045 is a normally closed, two-way unit designed for continuous duty at ambient temperatures between -65 and 200 F., at pressures up to 12 psi. Weighing 0.44 lb., dimensions are 1 1/2 in. high, 1 1/2 in. wide, 1 in. thick. It's claimed that device has been subjected to extended life and performance tests covering its full operating range of temperatures, satisfactorily meeting requirements. Other models, both two-way and three-way, handle fluids at pressures up to 50 psi and can operate satisfactorily at temperatures as high as 450 F. With slight modifications, these can give maximum operation at this elevated temperature.



### For Force Measurements

New force indicator made by Rhear Spring Co., Lincoln, Pa., utilizes piezoelectric compensated spring system to give true force measurements accurate to  $\pm 1$  graduation at  $\pm 1$  percent of full scale of dual indicator. Force is applied to system through load transmission rod, whose movement deflects compensated spring system, deflection being measured by low friction, fully pivoted indicator. Accurate indications (spring constant) are obtained possible because of relationship between force and spring displacement is linear throughout full range, gradient of spring system is made with accuracy of  $\pm 1$  percent and friction is virtually eliminated. Instrument is shaped for easy one-hand operation. Attachments include single-thrust belt test, pulling hook, central point-force application. V-notch throat fitting for lateral and pressure, dual fitting for resistant edges and wedges, and  $\frac{1}{2}$  in. extension rod. Simple scale and tape read in conjunction with hook, are handy for tests of tangential force. Unit has 18-0 capacity.

### Water Injection Pump

New series RD-6500 fully submerged pump for aircraft anti-deicing injection is offered by Moore Pump Co., Division, Kent, Inc., Lima, Ohio. It delivers variable controlled fluid bypass to prevent compression of air in fuel system when used in operation on empty tank, and anti-friction isolation prevents backflow of running. Total submergence of pump and motor and within confines of streamlined tank superficial installation and requires no external space for mounting. The kind of gasketing is eliminated by adhesive use of nonconducting insulation between contact points, thus preventing water from seeping in electrolytic where dampness exists in present. Relief valve is adjustable to 90 psi outlet pressure, with connection for superheated compression optional. Characteristics of typical valve setting are 210 gal/hr at 34 psi outlet pressure, with maximum capacity of 1.1 at 250 d.c. Flashed horsepower 4000, 2000 alternating motor are included in the series.



### Pressuregraph Adapter

Snapping adapter, an engine jack up for pressuregraph system, is offered by Rhear Products Laboratories, 345 W. Randolph St., Chicago 6, Ill., to provide increased efficiency in running tests and eliminate need for special handling of blocks. Employing standard hand plug as integral part, device will operate in aviation fuel test engines. When pickup is inserted, displacement acted on by pressure impulse modulates electro-mechanical modulated voltage from pickup is delivered to pressuregraph amplifier, and passed through negative modulation amplifier, then to the oscillograph.



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Just as during the war, EEMCO has remained an area pioneer in electronics on serving the aircraft industry—performing a specialized design, development, engineering and manufacturing service. Leading aircraft builders have relied on its contribution to some of the most important aircraft of the last decade, and so many more are now under development. EEMCO-built motors and actuators have solved the very toughest problems of function, power, size, weight, shape, performance, installation and operation. Let EEMCO tackle your problem.

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Major alloy valve-type. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



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Major alloy valve-type. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



**VARI-CAN SQUARE ACTUATOR**  
Magnetic clutch and brake. One-hand control. Force. Pressure. In the National Stock.



**HYDRAULIC PUMP DRIVE MOTOR**  
One-hand control. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



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Major alloy valve-type. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



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Major alloy valve-type. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



**2-SPINDLE ACTUATOR**  
One-hand control. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



**PULSE GEAR ACTUATOR**  
Major alloy valve-type. Magnetic clutch and brake. Valve stem flow. Designed in most in emergency space requirements.



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Check with us for a special motor or actuator design problem. Give us the following preliminary data:   
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• Specific function   
• Type of use   
• Material and operating conditions   
• Any special requirements, diagrams and notes should be provided.

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# PRODUCTION

## Missiles to Reform Production

Airframe firms face real mass production problem, where daily output will have to be in thousands.

If \$5 airframe companies are faced with the necessity of radically changing their manufacturing techniques to deal with a new element mass production of guided missiles.

The situation already is becoming apparent in the growth of the training missile program and testing for the \$10 million north of production and testing from Air Force, Army Ordnance, Navy Ordnance, and Bureau of Aeronautics.

What Harry Woodhead, former president of Consolidated Vultee Aircraft Corp., told the President's Air Policy Commission in the fall of 1947 is no longer holds true.

We anticipate that the manufacturing process [for guided missiles] will be fundamentally similar to those of subsonic aircraft.

Firms in Woodhead's graduation develop from two basic requirements of missile production:

- Complete removal of airplane production objectives
- Complete removal of airplane production objectives

An American Works survey shows that the aircraft industry is aware of the requirements and is willing them to pattern missile production planning.

Thousands vs. Hundreds—Once past the development stage, the industry will find itself for the first time facing out to thousands of units but actually thousands of missiles in the "massive" category.

Airframe plants now devoting 10 percent of their space to sheet metal fabrication, largely removed, and 25 percent to machine operations, will be forced to add up to as much as 80 percent machine operations to missile airframe workbenches. Missile steel used fabrication may involve as much as 20 percent or less of production facilities.

Also Differ—Obviously, the guided missile will be designed for a short service life as opposed to the basic requirement of designing and producing an airplane for continuous maintenance.

Disassembled tolerance allowances in airplane manufacture will have to be tightened in missile manufacture. Manufacturing discrepancies which can be allowed after an airplane has been delivered to the customer cannot be allowed in a missile, which must be

one light and must be "right" before the launching button is pressed.

Conversely, missile production will permit wide latitude in structural fit requirements, because the flight life will be relied on controls and sensors.

Materials Differ—While the principle differences between airplane and missile assembly equipment will be diametric, the missile form presents radical variations in materials and assembly techniques.

The vast quantities of a full-filled missile production program will for the use of non-strategic materials wherever possible. Cost factors, for example, will lead the use of surplus such as 75 ST.

But the present concern of United States manufacturers is that materials will be the foundation of missile form of all sorts.

Rivet Problems—Most significant concern by a missile production engineer is the simple statement:

"Now we have to find something to use in the place of the rivet!"

In large quantities, employing thin and more form, the rivet is a costly item considering that the missile is expendable. The industry's missile divisions will be highly receptive to new, low cost sheet metal, bonding materials.

Airframe manufacturers anticipating large missile orders will have to devise numerous new machines. Numerous new processes and tooling business will be needed. For small missiles whose form will be machined from solid castings, forgings, and extrusions, there will be need for complex machines.

Labor Factor—For what this expected mechanization will mean in terms of labor is difficult to predict at this time.

One factory engineer believes that, despite the weight, missile production may require no more than 50 percent of the manpower needed for airplane manufacture.

For our time, a high percentage of airplane production manpower is spent in outfitting the interior of the airplane.

Reduction of manpower required for producing a pound of guided missile should bring about a related improvement in the manufacturing "turning over," compared with airplane production. The time factor as compared of a missile contract to attainment of full production should be relatively short.

unimpeded by modifications which have proved to be the greatest influence against the learning curve.

How Much Automation—One aspect of missile manufacture is steeped in automation. This is the question of just how much of the finished product will be the manufacturing responsibility of the airplane manufacturer.

An outgrowth of missile design shows that approximately one third of the product is weapons, and the remainder propulsion, guidance, and weapon accessories.

Some airframe companies seem, at this time, to be satisfied with the prospect of building up the airframe and delivering it to assembly shops where the "warrior" will be installed. Others are planning for contracts under which they will receive control and propulsion components from accessory manufacturers and then perform complete assembly.

A number of manufacturers appear to feel that missile form and accessories is so tightly integrated that they should do the whole job, even main fuselage electronics and control accessories and power units.

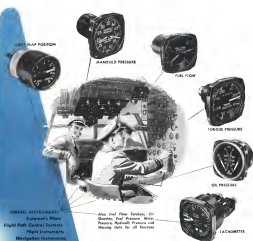
Indication of the thinking of the latter group may be seen in their creation of electronic engineering processes within their factories, considerably at this time, to "standard" the selection of their structures in vendor areas.

Accuracy Self—Some military manufacturers view this as a distinct threat to their participation in missile mass production, and accordingly are campaigning to convince military procurement agencies that they have no interest in the military end of the business, but do have accessory production knowledge which no airplane contractor, devoted to aerodynamic structures, can hope to achieve.

While airplane manufacturers avoid discussion of the possibility of a serious battle for contracts to build a complete missile, it is apparent that it might be to their economic interest to do the missile assembly production will be considerably less than these great from airplane manufacturing, and that that return from building the missile form alone might be marginal.

A significant aspect of missile manufacture is that it need not await the requirement of actual combat to reduce peak production.

For some time to come the bulk of military missiles will be in small and medium size categories, such as weighing less than 2000 lb designed to replace ordnance. Relatively few supersonic missiles, weighing above 2000 lb and requiring approval of several times the size and weight of the V-2, will be constructed immediately.



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The entire center in the huge and complex aircraft of today is the Flight Engineer's instrument panel. To assure you the utmost in uniformity and accuracy in this vital spot, Eclipse-Pioneer provides production remote indicating systems for practically every single function required. Each instrument is an example of the skill and craftsmanship that have built Eclipse-Pioneer's reputation—one of the oldest and finest in the field. When you specify these all-important engine instruments for your planes, you yourself every advantage by selecting Eclipse-Pioneer—one source, one high quality for all!

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## A Lift and a Light for Berlin

"Aircraft's greatest achievement." That statement has been applied many times to the Berlin Airlift. And rightly so. The Airlift has changed all military logistic concepts . . . lessons learned from the operation will affect the future of all aviation.

Among equipment selected for this vital task, the Westinghouse name appears with significant frequency . . . particularly in those applications where dependable performance counts most. Typical examples are shown on these pages. A new cargo hoist—more powerful and with many times the life of former units. Flashing beacon lights—four flash with a brilliance 5 times greater than the sea's.

Transformers—that can take a direct stroke of lightning without failure.

These illustrate why, on the tough assignments—those call for unflinching performance—you'll find Westinghouse equipment being selected. And it is also why Westinghouse is your best source of supply for all your aircraft needs—from tiny aircraft lamps to powerful turbo-jet engines . . . from radio and radar to giant wind tunnels.

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page

### Hoist speeds loading and unloading

Westinghouse engineering was put to use when asked to design a cargo hoist unit that would be dependable under all conditions . . . be completely explosion-proof. The answer is illustrated here. This unit can lift 4,500 lbs. of cargo at 24 feet per minute . . . weighs only about two pounds. The assembly consists of a heavy four roll motor, a single planetary gear, a speed limiter and a magnetic brake. Because of its long life, no spare need be carried by the plane, saving weight.

### Lights penetrate heaviest fog

A major problem of the Airlift has been its high-grounding fog. To combat this condition, Westinghouse Flashing Beacon Lights are being installed at seven Airlift fields for precision purposes. These lights make visual landings possible under worst weather conditions. Flashing 40 times a minute, the lights can penetrate the heaviest fog for a distance of at least 1,000 feet. However, the peak flash does not blind the pilot because its apparent duration is so short. On clear or hazy days, or close to light foggy nights, the intensity can be reduced.

### Safe transformer operation

The "CSP" (Complexity Self Protection) transformer—long accepted as the best transformer under all conditions—provides safe aircraft lighting, instrumentation and avionics. And the fact that CSP transformers are being used for approach and other critical lighting,



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LEADER IN  
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**RIGHT**—Powered by an engine under testing, built by radio, guided by remote control, Martin's latest (P-30) biplane prototype (center) has made the longest flight ever achieved by a piston aircraft powered with one jet engine.

**LEFT**—Using models, another product of Mary Sue's teamwork, will soon go on in the hands of 200 pilots into the atmosphere and achieve, eventually, information back to the ground for better research. These missing details will go many miles beyond the V-2, reach a maximum speed of 4,000 ft. per second.

## SALES & SERVICE

### Endurance Record Falls—Hard!

Pair in modified Aeromacs aim at 1000-hour goal after leaving previous 726-hour lightplane mark well behind.

With a new world's endurance flight record already established, Bill Harn and Dick Madal early last week continued their monotonous grid shift in an Aeromac Sedan, christened "Sweetie Lady," in an effort to reach a new mark of 1000 hr. at Fullerton, Calif.

At 5:44 p.m. (PST) Apr. 14 they had passed the 726-hr. record previously set by Wes Carroll and Clyde Schlegel of Long Beach, in 1939.

► **Fourth Attempt**—The Aeromacs in the same 1948 Sedan in which they previously attempted three other endurance flights. Last December they were forced down on their third attempt after 58 hr. by icing conditions.

A new C-145 Continental engine was installed for the successful attempt. Engine installation was modified by Don Young, Macaulay-Dethlefsen Corp. engineer, to prevent oil changes in flight.

► **Oil Changes**—Mid-flight oil changes included a drain line from the crank case to the tail of the airplane fitted with a shut-off valve, a valve gear mounted on top of the fuselage made capable to show oil level in endurance, a reserve oil tank to supply fresh oil replacing that drained was situated in the cabin floor, a hand-operated oil pump forced fresh oil through a low-loss reserve tank to endurance after pump showed oil had been nearly drained, regular filter screen was replaced by a fitting which he passed the oil through a line to a four-way valve attached to filter screen in cockpit, he setting valve in one position to send flow through valve, screen and back to endurance. In another valve position oil flow could be put across and return to endurance. This was used only at intervals when it was necessary to service the screen, inspect, clean and reinstall it.

The six-cylinder, liquid-cooled engine develops 165 hp at 2700 rpm, but turns over at 2160 rpm, at the cruising speed of 100 mph which was selected. Fuel consumption was reported less than 7 gal. hr. and oil consumption approximately 4 gal. hr.

► **Fuelage Goal**—The airplane was being fueled by jacking up the gasoline can from a Jeep trailing at 65 mph. In the opinion of Harn and Madal, this method included the danger, a man who held the empty can, and another who handled the full fuel can.

Plane is equipped with 51 gallon capacity fuel tanks sufficient for 12 hr. flight without refueling. Normal fuel tanks for the Sedan hold 36 gal. Fuel rate of consumption is fitted with a screen and an shut-off point may stop while the other fly.

► **\$50,000**—Sagadahoc-Barnes, 35, and Madal, 35, both workers at Fullerton Air Service, were licensed as flight instructors by the Federal Chamber of Commerce which had just approximately \$10,000 into the flight at the time the record was broken.

Food prepared by debriefing was passed daily to the Ryan from the Ryan and included approximately a liquid diet of milk, orange juice and tomato juice, but no water.

► **New Wrinkle**—A new variation in

endurance flights was the cross-country one-day flight to Miami, Fla., and return, following good weather forecasts to avoid regulations of the wing model which could make their last Dinosaur flight.

Approximately 3000 persons came out to the airport at the time the old record was exceeded, and the crowd increased with the advancing to a point where the Jeep moved over to a nearby USAF field to complete the operation. At night, the Ryan have been taking the plane over to the desert near Palm Springs, to Thomas, a place which has consistently clear night weather, to avoid any bad night weather at the home field.

► **Broken Window**—On one occasion in a night passing the Ryan broke a window and continued through the night with a piece of cardboard stuffed in the opening. A replacement window was passed up and city, and installed.

Schlegel, member of the Chamber of Commerce, at least as far back as 1937 when U. S. Air Service pilots Smith and Kiskadee accomplished the first plane-to-plane refueling at Roswell field, San Diego. Better known as the "American Mail" biplane transport endurance record of 193 hr. was set in 1927 by Maj. Carl Spatz and Capt. H. C. Eiler, both later USAF generals.



### Wee Wing Preparing for Tests

A neophyte model flying wing type craft, the Wee Wing, is expected to be test flown in the near future. Designed and built by Richard M. Selberg at San Francisco, Calif., craft is constructed of plastic balsa plywood and is purely experimental.

With an S-160 Target engine, the plane has turned and left ground briefly, with good showing of control. Selberg intends Amman Wee he will replace engine with a 25 hp. Nelson engine, and rebuild center section

wing roots to increase span from 29 ft. to 31 ft. Pilot occupies a pod similar to that of a biplane (see illustration on page 42).

Wing chord is 42 in. at center and 5 in. at tip. Wing of parachute with saddle has 5 in. thickness. Prone to cycle just will be replaced for test flights with modern gear. Controls are operated by scrubber.

Conventional rubber pedal operate winging drag rudders and wheel operate elevators which also serve as ailerons.

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PROPELLER GOVERNOR  
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one of the all-in-one test fixtures of the  
"GOVERNORITE" now being built by Greer.

The Greer Governorite, long recog-  
nized by the aviation industry as the  
standard in accurate testing of hydraulic  
and electric propeller governors has now  
been enlarged and improved to meet the  
higher demands of new governors. The drive  
power has been increased from 5 to 7½ h.p.  
the feathering speed has been improved by  
reducing the 7½ h.p. motor and 1½ gpm pump  
previously used with a 3 h.p. motor and a  
½ gpm pump.

Governors testing is completely automatic  
or manual whichever you prefer. From  
internal hydraulic and electric circuits an  
automatically energized from a 5-gpm test  
control switch in test bench, Greer,  
Westwood in Elkhart, Indiana.

The Governor is tested while simulated  
flight conditions with the governor control-  
ling the engine and a hydraulic mechanism  
used to simulate various feathering  
governor operations such as propeller  
latches, etc.

Test time has been cut down to just under  
10 minutes.

Further details will be sent upon request.

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craft systems and components are also avail-  
able. Write for your copy of our complete  
catalog.



**BRIEFING FOR DEALERS & DISTRIBUTORS**

**PROPELLER GOVERNOR**—Flight tests have been completed on a new type propeller governor developed by Robert Flaherty, president of Flight Research Engineering Corp., Richmond, Va., and designed as an accessory for standard Bendisworth controllable propeller models R-200 and R-300. Unit will be priced at less than \$700, weighs 11 lb., including controls, and installs in a slot measuring behind the instrument panel. The governor is superior selling at lower cost than anything previously offered for the same purpose.

By attaching it to this controllable fixed gear the combination acts as a constant speed propeller, with constant engine rpm regardless of turbo-boost, power setting or attitude of aircraft, within 25 rpm, plus or minus. By using the governor the engine instantly returns full takeoff rpm when the throttle is opened, since the propeller blades immediately go to correct pitch.

Full economy and decreased pilot fatigue are also cited as other advantages. Manual auxiliary control is provided in event of possible failure of the mechanism.

In a series of engine tests at Ford Municipal Airport, Flaherty reports that "all possible combinations" of artificially induced failures were tried. In all such tests the propeller either reverted to full allowable flat pitch, or, if it was in its opening pitch, but showed no tendency to run away. FAA approval on the governor is expected in time to make first deliveries late in May.

**AVIATION WEEK, MICHIGAN STYLE**—Stuffed produce of Bendisworth's Bill Menn can be detected in the elaborate and detailed planning which is going on for the Sixth Annual Michigan Aviation Week, June 3 to 12.

Menn, who is being transferred from his Detroit post to advertising director for the corporation in Baltimore to head up Radio, News and Television division, a general chairman of the Michigan Aviation Week. He has set up a committee of 100 Michigan citizens, with Gov. G. Mennen Williams as honorary chairman, and expects to have some 500,000 people participate in events of the week.

Michigan industry has subscribed a \$10,000 budget for promotion of the affair. More than 60 Michigan airports are expected to hold open house June 11 and 12. Other events include a photo exhibit June 5 at Lansing, with 5,000 worth of photos, model plane championships, flying lessons, field day, aircraft design contest among students of Michigan universities. Included, too, is a May Michigan aviation contest, air passenger and air cargo demonstrations and aviation exhibits, photo and art contests among high school students.

It is probably the biggest state-wide aviation promotion in this country, and all plans of aviation should say before it. It is probably the biggest benefit in getting the various aviation interests in the state to work together, even for a week. There are other states where aviation people could take a lesson from Michigan and Iowa.

**BACK TO FARM**—Victor in Sturtevant, Wis., recently decided by a decisive vote of 7756 to 3345 not to build an airport, thus setting some 10 years of argument to rest. Land had already been purchased for an airport, but was being rented for farm use pending the voters' verdict.

**55 MINUTES**—Bill Wagner, Ryan public relations director, has a column of "ten-stories about the Nixon, which he will tell to anybody who will listen.

Latest is about a pleased customer, name of "Red" Fodera, an accountant for the Martin Construction Co. in St. Joseph, Mo. It seems Mr. Fodera has occasion to go frequently from St. Joseph to Boise, an apparently small matter of semi-regular driving.

Up in Idaho, where winters are vicious, it takes him 12 hours on the road. But then, why is Mr. Fodera pleased? He has discovered that he can make the trip in 55 minutes, in a certain all metal four-place bicycle gas airplane manufactured on the West Coast, a set saving of 51 or 52 min. regardless of road conditions.

—ALEXANDER MOURIZY



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**DESIGN SIMILARITY SERVICE**  
Conventional circuit design, fewer numbers and types of tubes, plus open mechanical construction simplify tube stocking problems and simplify maintenance. The entire transmitter portion of the Type 364A is built up as a sub-type chassis, readily removable from the floor of the panel.

**REAR BACK MOUNTING SAVES SPACE**  
Compact design requires only 15 inches of rack space for installation, frequently utilizing space already available.

**100% FREQUENCY STABILITY WITHOUT TEMPERATURE CONTROL**  
Through the use of a newly developed crystal, troublesome temperature controls and crystal ovens are no longer necessary to provide adequate frequency stability.

**SIMPLIFIED CONTROL FOR REMOTE LOCATION**  
Modulation over a single telephone pair and carrier control by means of a simple circuit allow the transmitter to be readily located at a remote point.



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## AIR TRANSPORT

### Skycoach Builds Traffic and Strife

As load factors soar, Capital and NWA fight over competition and UAL wants TWA aircraft ended.

The traffic-generating success of low-cost Skycoach operations in certain domestic markets is becoming increasingly apparent.

Capital Airlines and Northwest Airlines have reported spectacular load factors on their new Skycoach routes started this spring. And officials of both carriers are now regarding the new luxury service as a permanent part of air transportation.

Revel Airlines and National Airlines are preparing to board the Skycoach bandwagon shortly. Burrell has requested authority to start 4-month-old "dark flight" service between Dallas, Fort Worth and Chicago on May 17, as well as DCA to NAL, with its own Skycoach line. "Nightbird" DC-4 operates between New York and Miami by end May.

■ **Continental** General manager (in control report to stockholders, Capital Press, April 11) H. Carverton said the company has shown a continuous net profit on Skycoach services since they began Nov. 4. This profit, he made clear, was produced after the operation absorbed its parental share of overhead expenses—all of which stated whether the aircraft was conducted or not—and after paying all special promotional costs.

■ **Capital** will continue to evaluate the possibilities of offering two basic pas-

senger levels, one for standard service (at class 1 fare) and the other for Skycoach (at 4-quarter mile). Continental continued: "The latter will be expanded whenever the travel market indicates that an aircraft operation is sound. Events of the past few months clearly indicate that success is the forerunner of a new phase of air transportation."

■ **Northwest** Executive Coach—Grandfather, president and general manager of Northwest, viewed similar structure as his annual report: "Determined air service to meet the needs of mass use of air transportation will be developed by NWA at the same objective for the coming year. In December, however, it has become increasingly clear that lower rates are not only economically feasible but must be offered if the air line is to develop mass transportation."

The NWA president said his company contemplates offering three classes of passenger fares: 1. Deluxe, starting at \$100; 2. Standard, starting at \$60; 3. Skycoach, starting at \$40. A standard service such as that now offered by DC-4 and Vickers D-2 is expected to be a minor part of its overall operation without the requirements of the standard service.

■ **High Loads Reported**—Northwest reported that passenger load factors dur-

ing the first 10 days of its bi-monthly-metric DC-10 coach flights between New York and Seattle were about 78 percent compared with over 91 percent on scheduled service until May 7.

Whenever the flight load capacity of 55 passenger seats was "topped off" with cargo. Since most of NWA's cargo comes from seat to seat, while the heaviest cargo passenger business has been down seat to seat, the two kinds of service are complementary.

Capital, which inaugurated a New York-Memphis service operation on May 25, achieved a 61 percent load factor during the first 15 days of April. On the Washington-Chicago "Nightbird" coach run, started April 1, Capital's passenger load factor was 70 percent during the first 10 days of service.

■ **Capital Buys Three** In—On the Washington-Pittsburgh coach route started April 1 and connecting with the New York-Memphis coach flight, Capital's passenger load factor over 61 percent during the first 10 days of operation. Capital's original "Nightbird" service from New York to Chicago showed a 75 percent passenger load factor for the first 10 days of April alone, and factor on that run was a 57 percent (61 percent combined) and 75 percent combined.

In contrast, Capital's overall passenger load factor during the first 10 days of April (heavily weighed by the more numerous regular flight) was only 51 percent. Company estimates based on preliminary load factor on its 68 scheduled DC-4 aircraft is 50 percent.

■ **Close Over Competition**—Already Capital and NWA are at odds over the use of the bi-monthly metric. Capital has asked the Civil Aeronautics Board to suspend Northwest's proposed competitive 4-seat mile Skycoach tariff.

between Washington, Pittsburgh, Cleveland, Detroit, Milwaukee and the Twin Cities.

The new NWA coach operation was slated to begin late last year. Capital said the service, to be conducted with 30-passenger Martin 2-0-1s, would be "substantially different from the low DC-4 flights now offered by both NWA and Capital."

"Six with a 100 percent load factor, Northwest could not break even at 4 cents a tick plus only 35 passenger miles," 2-0-1," Capital told C.A.B. President Carverton said he declared that neither Capital nor NWA could operate competitive Skycoach services between Washington and the Twin Cities at a profit. He pointed out that Northwest had already operations depend on competitive fares loads.

■ **UAL Battles TWA**—Meanwhile, United Air Lines has complained to C.A.B. against operation of TWA's King City Los Angeles DC-1 do-mestic flights (started Feb. 7) to the New York-Kansas City and Los Angeles-Pittsburgh lines on May 1. TWA had indicated it would cut service through United to meet board line service. Northwest (which would be required at Kansas City) that United between TWA is zoning at a standard New York Los Angeles coach service for \$160.50 compared with the regular \$177.95 rate.

Replies stating TWA's new coach operation. United wants C.A.B. to use TWA's present low fare. Kansas City Los Angeles service. At the recent C.A.B. "showdown" meeting, UAL President W. A. Peterson declared that aircraft service cannot be partial under present cases.

A few days earlier, TWA President Ralph Diazo said passenger acceptance of his company's DC-1 aircraft operation between Kansas City and Los Angeles was about twice that expected. He added, however, that it was still to be determined whether the coach traffic is new business or business taken from regular flights.

### New Building

A \$35,000 temporary administration building to provide passenger facilities is to be built at Vancouver International Airport. It will replace facilities destroyed by fire earlier this year.

The temporary facilities will be provided through erection of the shell at the future airport terminal on the site of the burned-out administration building and will cost \$170,000. The Airlines will finance the building. Plans have been approved by Vancouver City and forwarded to the Department of Transport at Ottawa.

## Earnings Reflect Traffic Gains

Carrier statements show operating deficits are down and revenue passenger mileage is above last year's levels.

Carrier statements for the first quarter of 1949 indicate that operating deficits are down and revenue passenger mileage is above last year's levels.

■ **Continental** announced month by month airline traffic during the first quarter of 1949 probably hit above last year's levels. And earnings statements show it.

Revenue passenger mileage flown by the 16 domestic trunklines during February scored more than 32 percent above totals for the same 1948 month. In January, the increase had been a modest 1 percent.

■ **More Gains in March**—Earnings figures for March show more gains. Revenue passenger mileage for the month 121,693,000 revenue passenger miles—up 17 percent over the 84 million reported for March 1948.

■ **Losses Paid**—In March, United Air Lines lost \$5,475,000 revenue passenger miles compared with \$5,475,000 revenue passenger miles in March, up 54 percent over the same month last year.

Traffic levels of both American and United were depressed during last quarter.



NWA AWARD

The President's Certificate of Merit—highly honored that can be given to a civilian or organization was recently awarded to Northwest Airlines in recognition of its wartime activities.

Cord Humber, president and general manager of NWA, by Lt. General Curtis LeMay, commanding general of the Strategic Air Command for the airline's and its employees' outstanding contribution to the war in maintaining a bomber modification center at its main operating base in St. Paul, Minn., and in operating a transportation "lifeline" to Alaska and the Aleutian Islands during the war days of the war.

General LeMay was met by Mr. Humber at the airport from his personal plane at Northwest's base at Holmes Field in St. Paul.

to 1948 because of the DC-6 ground rule. Even so, gains this year have in many cases exceeded expectations. Freight and mail volume is running far ahead of 1948, although express is down slightly.

■ **Losses Paid**—In March, operating deficits of the 16 domestic trunklines totaled about \$3,450,000, or the \$4,811,000 loss reported for January, 1948. (American Wire, April 11). In February of last year, loss was a meager \$5,738,000. (Include recent retroactive and post-war.) The carrier's operating deficit this year February is not expected to exceed \$3,500,000.

American Airlines, which lost about \$1,240,000 in March 1948, estimates it can close the deficit by mid-May. In the same month the year before, it lost the \$4,800,000 deficit shown at the end of the first quarter of 1948. A loss in the same period this year should be under \$1 million.

■ **UAL Reports**—United isn't doing as well financially, it lost \$2,573,000 on domestic operations in the first two months of 1949, compared with \$2,623,000 in the same period last year. But UAL's revenue loss for the first quarter 1949 will be less than for 1948, according to United's President W. A. Peterson.

TWA also lost considerably more on domestic service in January-February 1949 than the \$750,000 dropped in the same two months of 1948. Yet here again the revenue loss for the first quarter is expected to be under 1948 levels.

■ **Domestic Traffic**—Aided by special air routes, passenger travel on TWA's international routes during first two months of 1949 was 50 per cent above 1948. Losses were down sharply. The same general situation held true in American Domestic Airlines and Pan American Airways' Atlantic division.

Two small domestic carriers—Delta and National—also saw the light. Delta, for instance, lost \$1,240,000 in January-February 1949, while it lost \$1,717,000 in the first two months of the previous year. National made about \$493,000 domestically in January-February 1949, against a \$448,800 operating loss in the same period in 1948.

■ **Profit for Eastern**—Eastern Air Lines' profits during first quarter 1949 are reported to be the highest since the first three months of 1948, when the carrier netted over \$1 million. After a daily loss January, EAL's passenger



AA WORKSHOPS AWAIT NEW OWNERS

Replaced as passenger service by DC-6s and Constellation, several American Airlines DC-6s and DC-4s are shown parked at the carrier's Tulsa, Okla., overhaul base. Some are being modified for passengers, and others

are still awaiting bodies. On May 31, when AA retired its last DC-6 from passenger service, it acquired the last of its Constellation fleet on orders. American's 198-6 were retired from passenger service in De-

cember, with some of them going into company's cargo operations. General completely new passenger passenger plane fleet cost \$68 million—about \$22 million for the 75 DC-6s and \$46 million for 39 DC-6s.

traffic picked up sharply in February and March.

Western Air Lines reports that preliminary figures for March show a chance of breaking even for that month for the first time in five years. W.A.L.'s first quarter operating losses will be far under the \$653,930 figure reported for the same period last year.

Capital Airlines' operating losses during the first two months of 1949 were slightly under the \$122,000 deficit which was reported for the same period during 1948.

March showed further improvement, and a profit is expected in April. Revenue passenger mileage reported by Capital as the first two months of this year was up over thirty percent over last year's figures for 1948.

■ **Deficit Wiped Out**—In its recently-submitted annual report for 1948, Capital disclosed an \$815,118 operating profit and a \$121,967 net profit. Prior to large attractive cut-backs, the carrier had shown a heavy loss in the report for this year.

These small payments also trimmed capital's loss for 1947. Originally, the net deficit was set at \$1,657,060, but retroactive net payments reduced this to \$561,060.

President J. H. Carmichael noted that 11 months ago Capital's existence hung by a hair's breadth. "Today," he said, "it is a vigorous, going concern."

Carmichael estimated that Capital's passenger traffic for 1949 would approximate that of 1948 but that some signs point to growth. He declared the company could handle substantially more traffic without expanding present facilities.

■ **Capital Eases New Equipment**—Any expansion program involving replacement of Capital's DC-4s and DC-3s is contingent on the successful conclusion of a refinancing plan, the annual report stated. Several new types of equipment are being studied by the company.

Realizing that its present DC-3s must be kept in service for some time to come, Capital is modifying them to carry a deficit of 21 passengers and a seating-belt-in-step, carry-on baggage facilities and rear cargo compartment seats. This work, costing only about \$8000 per plane, is being done as the carrier's new ships. Modification of the carrier's DC-3 fleet is to be completed by mid-summer.

■ **Improvement for NWA**—Northwest Airlines, while still deeply in the red, is also showing some improvement. During the first two months of this year, the carrier's domestic traffic was down slightly from last year's levels, but operating losses were reduced.

NWA's monthly annual report for 1948 showed net loss of \$337,374, compared with a deficit of \$1,144,370

## Where Air Mail Money Went

Big Five Carriers	Revenue	Tim Miles
United	\$1,458,139	8,195,267
TWA	5,137,011	8,031,298
American	4,908,959	8,993,487
Eastern	2,910,001	4,678,772
Northwest	2,852,485	2,197,451

Midsize Rate Carriers	Revenue	Tim Miles
Chrysler	\$1,372,237	484,110
Delta	2,346,022	827,025
Boeing	2,658,792	948,782
Northeast	2,115,389	74,097
Southeast	1,907,415	45,542

Other	Revenue	Tim Miles
South	1,002,415	450,731
Panama	1,141,718	73,589
Western	1,130,543	467,042
Colonial	3,562,734	51,636

The "Big Five" domestic airlines handled over an trillion as much mail business for the government in 1948 as the 25 other certificated domestic carriers and did this job for about \$15 million dollars less than what it cost with the smaller operators.

A CAB study submitted to Sen Robert McNamara (D., S. C.) shows that the government's domestic mail business for calendar 1948 totaled \$7,925,996 two orders, pay-

Midsize Rate Carriers	Revenue	Tim Miles
Continental	\$1,151,417	126,155
Trans-Texas	1,132,875	57,942
Northwest	1,015,196	34,444
Monarch	995,709	41,100
All American	957,791	284,008
Mid-Continent	925,031	11,240
West Coast	857,170	16,785
Pennair	854,079	21,841
Empire	823,608	15,903
Challenger	815,774	7,917
Florida	758,187	10,781
Loisair	644,158	10,781
Wya. Central	498,246	11,571
Los Ang. Air	377,536	28,490
Caribbean	352,961	6,693
Submarine	36,936	1,811
Reunions	28,911	46,318

Midsize Rate Carriers	Revenue	Tim Miles
Continental	\$1,151,417	126,155
Trans-Texas	1,132,875	57,942
Northwest	1,015,196	34,444
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Submarine	36,936	1,811
Reunions	28,911	46,318

ments to carriers totaled \$94,477,534. The Big Five flew 12,711,725 tim miles for payments totaling \$15,730,517. The 25 midsize carriers, including Reunions, handled only 5,191,671 tim miles for payments totaling \$34,107,022.

The survey shows that our field office, Florida Airways, received over 1000 fee calls for sale of mail flows. By contrast, the Big Five were paid an average of 65 cents per mail ton mile flown.

and subsidizing the railway under conditions of retained liability," said the report.

The Seattle-Tacoma Airport, where the Post of Seattle now is housed in a 5 1/2 story administration building, "already is obsolete," the report continued. "We believed the money all out of expenditure length and width for the equipment has used. Reentry lighting is inadequate, particularly on the U.S. runway. Neither runway or taxiway are capable of use."

Following criticism of the field by the post, Seattle Post Commissioner has ordered the main runway at Seattle-Tacoma Airport to be lengthened at least 1000 ft. CAA has been asked to provide matching funds.

Improvement program for the call for installation of high-intensity lighting, lack of which also was mentioned by the pilots. Night-fighting equipment will be stationed on the field next summer, says United and Pan American from Northwest and Western of the field. Present fire protection comes from King County fire district stations on three sides of the field.

Pilots had recommended that "the matter of crash and fire protection be taken out of the category of future planning and move immediate attention."

## Alaska Airlines Shows Profit For 1948

Showing substantial earnings on its worldwide nonstop and contract services, Alaska Airlines was well in the black for 1948. The carrier's first full year under President James A. Woods.

In spite of higher costs, reduced fares, and losses in its certificated route—within Alaska, the Anchorage-based company's profit for the year ended last Dec. 31 was \$152,433, compared to an adjusted net loss of \$611,278 for fiscal year 1947. Gross operating revenue was up 61 percent. Profits continued through the last quarter of fiscal 1949.

► **Overseas Flights**—Alaska Airlines has a contract with the Navy for mail to Alaska from Seattle to Fairbanks on the Arctic Ocean. In other cargo movements off its regular routes, AA has seen few lost complete around-the-world trips, six trips carrying military dependents from Seattle to Tokyo, 11 trips carrying mail from Seattle to New York, 87 trips for the annual leaves from the eastern seaboard to Europe in support of the Berlin airlift, 4 in weeks operating from Mexico City to London and Madrid for a Mexican flag line, and a two-month operation between London and Johannesburg for a South African line.

AA also conducted a scheduled operation between the U. S. and Alaska under special CAA exemption during the West Coast shipping strike from September to December. Recently the carrier has been transporting 9000 discharges from Alaska, Alaska, and Shugart to Hialeah, Florida. A few months ago company began a weekly round-trip between San Francisco and Tokyo for the military.

Eighteen aircraft were added to Alaska Airlines' fleet in the past year. C-47s' based from the Air Force, five new B-74 helicopters, and seven impromptu planes for bush operations, including Grumman Wildcat and Northrop Navajo. Company currently has pending before CAA applications for routes from Fairbanks, Alaska, to Coast Falls, Mont., the Twin Cities and Chicago, and from Anchorage and Kodiak, to Seattle, Portland, San Francisco and Los Angeles.

## KLM Service

KLM is now conducting its thrice-weekly Amsterdam-Boston-Continental flights on KLM's new and the 34th anniversary of March 1914. KLM came when the British and American governments refused to lift the ban on KLM aircraft because of Dutch police action.



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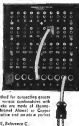
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## Survey Merger

(McGraw-Hill World News)

MONTREAL—Canadian Pacific Airlines has disposed of its share interest in the Photographic Survey Corp., Canadian associate of the British-controlled Manting Aviation Group, and will withdraw from the survey field. A subsidiary of the Photographic Survey, (Quaker) Ltd., will carry on the existing CPA contracts as well as its own parent company's business in Quebec. The new subsidiary, as well as to acquire CPA's survey aircraft and laboratory equipment, will retain CPA's Montreal office and center of its key personnel. J. P. Lalonde, president (superintendent) of CPA's survey division, is among those joining the staff of the new subsidiary. P. P. O'Brien, general manager of CPA's Montreal office, will become manager of the new subsidiary.

CPA has moved into its newly completed office premises, Toronto plant at 1450 O'Connor Drive.

## New Job for 314s

The veteran C-46s Boeing 314s, flying boats originally operated by Pan American Airways and BOAC, have taken on a new job.

Three of the 13-passenger craft, operated by American, are to start flying cargo routes from Europe to Australia in May. The other two, operated by American, are to start flying cargo routes from Europe to Australia in May. The other two, operated by American, are to start flying cargo routes from Europe to Australia in May.

World Airways, Inc., New York, announced plans to fly its fleet of seven Boeing 314s only that year (American News, Feb. 14). The company center in the flying boats on the New York-Baltimore-Pacific route in 1948.

## Competition in Calif.

Uncontested interstate airlines are making the heavily-traveled Los Angeles to San Francisco route, the ultimate in long-range transportation, in the deep course of carriers holding CAB franchises to the back. Even the big companies are worried.

California Central Airlines, which began operating the route with Douglas DC-4s only on January, apparently is going good year and getting a profit on its \$59.99 fare. Last month, Robin Air Lines entered the competition, offering Los Angeles to Oakland DC-4s with a round-trip fare of \$5.95.

►Braniff Airways—United Air Lines charges \$21.85 for the 40-mile

trip and Western Air Lines charges a flat \$20. The California Public Utilities Commission recently held hearings to determine whether California Central's fare is "just and reasonable," and a probe of Robin's operations is also planned. CAB, which is seeking also on non-scheduled routes, presumably cannot touch the scheduled interstate airline services of Robin and California Central unless interstate traffic is affected.

Reporting a 50 percent load factor in January and 76 percent in February, California Central says it made a profit during its first two months of operation. Load factor during the first half of March rose to 75 percent.

►Equipment—California Central bought its equipment from Airco Transport, Canada, Oakland, a 1939 non-scheduled non-scheduled operator of California Central, which has less than a dozen full-time employees, are the use in lease for ATC. California Central carried over 300 passengers in January, 3548 in February and over 2100 in the first half of March.

Robin Airlines, based at Burbank, also has flown transcontinental and early this year took over the DC-1 line. Robin Airlines, an Airco subsidiary, had with California Eastern Airlines and the Flying Tiger Line Air America suspended on 4 cents a mile cost to meet flights last Dec. 31 but plans to resume service this month.

## Airlines and Courts

U. S. courts are imposing high penalties on airlines whose passengers sustain injuries, either physical or mental.

In Tampa, Fla., a Federal jury recently ordered National Airlines to pay \$7500 to a man it allegedly carried from a plane on a flight of a regular route. The complaint and a deputy sheriff was sent to force him from the transport after he refused to cancel his reservation only a few minutes before plane departure time.

►Breach of Contract—NAA, and the suit was not on the other person had a standing reservation but that it was one it was not allowed until after the plane had been given to the captain, who was offered, but turned down, a seat on a later flight. The delayed passenger asked \$35,000 for his compensation, mental suffering, and physical injury because of delay, and the judge awarded the pay in full that National had committed a breach of contract.

In Minneapolis, a suit was a \$25,000 verdict against Mid-Continent Airlines for injuries suffered while he was a passenger on a plane that experienced turbulence. The complaint and the suit left warning light on the MCA

DC-1 bound from Minneapolis to Omaha should have been turned on by the pilot before the turbulence was experienced.

The plane was into a spiral. Passengers who did not have their seat belts fastened were thrown to the ceiling when the shock stopped suddenly. The complaint against Mid-Continent was filed by the passenger, who stated that the passenger assumed the risk for injuries sustained under such circumstances.

## Piedmont Ruling

Ruling that CAB has no power to award money to a carrier that did not apply for them, the U. S. Court of Appeals for the District of Columbia has turned a Board order granting a three-year order certificate to Piedmont Airlines, New York, N. Y.

CAB, in its northern states since December of Aug. 4, 1947, awarded Piedmont short-haul routes in Ohio, Kentucky, West Virginia, Virginia and North Carolina. While Atlanta, Charlotte, N. C., an unsuccessful applicant, printed the Board's decision, claiming that Piedmont had not sought the routes recently and that CAB consequently needed to authorize.

The court said that of 18 points Piedmont asked to route, only seven were on the routes awarded to Piedmont by CAB. The routes that granted Piedmont could not even be considered a modification of that carrier's proposed routes, which were "disturbance of routes, and totally unreasonable, capricious and arbitrary interpretation of the word modification." The court declared that the Board's decision was "arbitrary and capricious" and that the routes awarded Piedmont closely paralleled the routes applied for by the Airlines. In reversing the suit, the court remanded it to CAB for further proceedings. Piedmont has been operating its controversial routes since February, 1944.

## Ask Route Extensions

Braniff Airways is holding for major extension of its scheduled routes to include Atlanta. The carrier, which is now authorized to fly from Houston to Reno and Denver and Denver to Reno and Denver to Reno, has asked CAB for route extensions from Houston to Washington and New York, and from Reno to Seattle, Chicago, and other points.

The Braniff move came less than a month after Pan American International Airways asked into headquarters its suspended operations. PAN's routes are involved from Seattle to Washington and New York via Lima, Hawaii and other points.

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## Rickenbacker Hits Federal Subsidies

Eastern Air Lines President E. V. Rickenbacker, whose company has been the air transport industry's only consistent never-maker during the post-war period, has again lashed out at government subsidization of his competitors.

In a special letter to FAL stockholders, Rickenbacker asserted that subsidized competition is clearly inequitable and unfair to the non-subsidized operator. "So-called," he said, "violates the principle of private enterprise because it allows the government to compete with the individual. And it is unfair to the taxpayers who must bear the bill to cover the waste."

Formerly Republican-Rickenbacker declared that Eastern makes money without subsidy because it conducts its business at the highest level of efficiency and economy. He said that the 15 other domestic airlines had been run at EAL's cost level in 1947 they would have shown an aggregate operating profit of \$12,517,000 instead of the \$21,799,000 loss actually sustained.

The EAL executive charged that the airlines which have done the best jobs have received the least from CAB in grants of new routes and mail pay. He said that Eastern chose a large fleet, much of the competition which CAB has imposed on EAL would not have been authorized and Eastern itself would have been the recipient of aid.

Costs Compared—With costs of 4519 cents a minute on sale, EAL had a \$2,898,000 operating profit in 1947. United and American had the first lowest operating expenses, \$104 cents and \$109 cents a 300 mile, respectively, followed by Delta, \$383 cents, TWA, \$517 cents and North west, \$613 cents.

Rickenbacker said that if EAL's 4519 cents a minute and level American in 1947 would have shown a \$455,000 profit instead of a \$1,961,000 loss, United a \$1,214,000 loss instead of a \$3,284,000 loss and TWA a \$2,743,000 profit instead of the \$4,747,000 loss actually sustained.

## Boost for Low Rates

Scandinavian Airlines System is now seeking that the 25 percent rate reduction on monthly increases offered by trans-Atlantic carriers during the past winter was a huge success. It wants more of the same next year.

Between Dec. 1948 and Mar. 31, 1949, SAS reduced 6826 passengers on its North Atlantic route, 37 percent

more than in the same period a year before, with no measure of effect. Of the 6826 passengers handled in the six-month period, 18 percent, or 1235, flew under the exclusive rate. Of 3379 SAS passengers flown enroute to Europe, 35 percent took advantage of the special fare.

SAS General Traffic Manager Harold Cylwensund asserts that reduced fares are the only way to induce tourists to go to Europe in the winter season. He believes that when the trans-Atlantic airlines review the winter traffic situation later this year, consideration should be given to reducing the monthly rate increase into one more than 25 percent, making the ticket valid for more than a 10-day stay abroad, and lengthening the period when the reduction is in effect.

## SHORTLINES

► **Aerovias Nacionales de Colombia**—Planned to inaugurate bi-weekly DC-4 service from Bogota and Barranquilla, Colombia, to New York, via Miami on April 20. An affiliate of Pan American Airways, Aerovias has been operating nonstop between Bogota and Miami since January, 1947. Route extension to New York was approved by CAB three months ago.

► **Air Line Pilots Assn.—David L. Brehm**, ALPA president, has been selected president of the International Federation of Air Line Pilots Assns., which includes organizations from 18 nations.

► **All American**—Has begun regular Sunday service from Washington, D. C., to Atlanta City, N. J. via Baltimore, Dover, Del., and Middlebrook, N. J. Flights leave Washington and Baltimore at 7:00 a.m., Del., and Philadelphia via Eastern and Southern Md., and Georgetown and Dover, Del., via slated to start this week. AA's Washington-Pittsburgh and Pittsburgh-Atlantic City lines were activated previously.

► **BOAC**—Claims it carried more passengers and had a higher payload per flight than any of its trans-Atlantic competitors last year. Carrier made 503 non-Alantic crossings in 1948 with its 300 Constellations, carrying nearly 15,000 passengers at an average of 25.8 per day.

► **Canadian Pacific**—Plans to inaugurate trans-Pacific service from Vancouver to New Zealand and Australia on July 13 using Constellation. Four aircraft—CPA

lost \$993,445 on its domestic flights between in 1948, compared to a \$544,250 deficit in 1947.

► **DNL**—The Norwegian member of the Scandinavian Airlines System has decided to discontinue 30 of its 56 pilots as an economy move. Swedish and Danish branches of SAS made similar cutbacks recently.

► **Northwest**—Has declared a regular quarterly dividend of 28¢ cash a share on its 4.6 percent cumulative preferred stock. The dividend, totaling \$11,276, is payable May 1 to owners of record April 30.

► **Pan American**—Has received CAB authorization to expand service at Washington, D. C., to a bi-weekly on its North Atlantic route for another year. PAA and it would lose money if forced to serve Washington with the present traffic potential. Company flew 2353 passengers in and out of Alaska last month—25 percent more than any previous March.

► **Pittsburgh Air Service**—CAB has agreed to grant the unaccredited operator's request for a special exception to operate between Sidsa, Alaska, and Seattle.

► **United**—Has declared a regular quarterly preferred dividend of \$1.25 a share payable June 1 to stockholders of record May 15. Corbin Bailey has been elected vice president finance and property.

## CAB SCHEDULE

► **Apr. 10**—CAB announced its TWA Delta regional schedule for 1949.

► **Apr. 10**—Scheduling on seasonal service to Lake Tahoe, California 1949.

► **Apr. 10**—CAB's tentative schedule on Pull the trans-Atlantic route to be decided, including the Chicago trans-Atlantic service. (Continued 1112)

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# EDITORIAL

## Cream Skimming and Progress

For months the Air Transport Assn., protesting and stalling, has wailed bitterly that the unscheduled airlines have been "skimming the cream" of the air traffic.

Now, not one realized that we know has charged as much here as the scheduled carriers. So if the ATA then admits that it knows the low-priced commuter is the "cream" of the air travel market, would someone please come forward and explain why the scheduled carriers let someone else capture this cream first? They have been operating under the present law since 1938, and they have wide freedom in setting their own passenger rates.

If, however, ATA means that the "cream" is the long-haul traffic, then once again, would someone please tell us why—if they recognize the value of this long-haul carriage trade—they have not met the full demand for such service? Why has an entire new industry been able to win over thousands of transcontinental passengers in an incredibly short time, with so little promotion? Especially when their crowded services are slower, less comfortable, without meals. Is this the cream of the traffic? The scheduled transcontinental carriers have had the wherewithal to tap up this cream but obviously have failed to do it. Why? Everything was in their arsenal—time, experience, know-how, flying equipment, maintenance shops, sales personnel—perhaps everything but top management savvy.

Top management of the established industry has been underestimating aviation, underestimating the untapped talent of America. Until recently, it has been content interested in keeping the subsidy spigot open than in building air transportation on sound economic lines. Top management of some of the nonwieldy, unwieldy but agile, have not made these mistakes. They have kept in from the other side of the tracks and tapped up this cream the fat cats mightily scorned. The light is on. The interlopers will probably be forced out, except for a few. Certainly, a few should be permitted to remain.

For the scheduled carriers, weakened by the light, are finally making vigorous action in reducing fares, improving service, and making it difficult for CAB to perpetuate the standards. And Washington talks of separating the scheduled carriers from the service competition carrier. This is good for the industry. It will encourage more efficiency.

As ANTI-TRUST WHEAT has forecast for so many months, the Congress and the public are tiring of ever rising subsidies, ever rising fares, service too often designed to meet the carrier's rather than the public's needs, while

low cost operators who would offer a yardstick of competition are ground under the bureaucratic heel.

The Senate's investigations into the airlines bring the judgment day much closer. So does CAB's new, stiffer policies, as hearings in several have been recently. But don't let that preliminary bumbling leadwork anyone. The mood is essentially toward a tougher CAB, and rightly so.

Don all of due criticism of our airport administrators? Could be, if you are looking down your nose through those shameless lobbies.

But ANTI-TRUST WHEAT feels this way. Air transportation could become the most convenient transportation in all history. Our aircraft already lead the world. Who else but America can achieve that dream of ultimate status? Our latest air transportation potential is unbelievable. But only mass public usage will bring the maximum of personal, commercial achievement, and permit us to keep it.

Only private, competitive business will maintain the full vigor of air transportation. Government regulation and control will give us proportion to subsidy. The trend, then, must always be away from subsidy, never toward more of it. We have the government controlled airlines of Great Britain at the horrible example of government ownership.

Perhaps we shall never eliminate subsidy. But let us not wrap ourselves in cowardice and depend on the alms that others get, or have gotten, more subsidy than the airlines.

It is true that they have. But look at them. Do we envy the midwest today? If the midwest had had the gumption to modernize their railroads and their night-of-way, to speed up their service over the rear, improve their schedule, frequency, do you think buses and trucks would have grown at the phenomenal rate they have? We doubt it. Too many John Q. Publics got fed up with cinder shovels, slow freight, infrequent trains, and a general complacent attitude of "the public be damned."

Why should airlines make the same stupid error of its predecessors? Why can't commercial air transportation struggle like a dition to those over the catches of subsidy and stand on its own feet and sing it out with its competitors in the old American spirit of private enterprise, competition, and better public service?

ROBERT H. WOOD



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